

CADILLAC

Operator's Manual

1929



CADILLAC MOTOR CAR COMPANY
DETROIT

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Cadillac Motor Car Company

EDITION NO. 341-2

In ordering a duplicate of this Manual specify the
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CHAPTER I

Cadillac Service

THE owner of a Cadillac car has purchased not simply a fine piece of machinery, ingeniously designed and carefully built—he has purchased a pleasant and dependable mode of transportation. The car itself is only one factor in securing this transportation—the other factor is Cadillac Service, which is built upon a *standard policy, clearly defined to the car owner and guaranteeing him efficient service everywhere at standard prices under factory regulation.*

Cadillac-La Salle Service Stations

Cadillac Service extends wherever Cadillac and La Salle cars are sold. Service stations conducted by Cadillac distributors and dealers are designated as "Authorized Cadillac-La Salle Service Stations" and are identified by the exclusive sign illustrated on the cover of this manual. Wherever this sign is displayed, the owner will find an organization prepared to service Cadillac cars. This means proper equipment, factory trained personnel, a stock of genuine replacement parts and standardized policies and methods.

The car owner's first and most frequent contact with Cadillac Service will naturally be in the service station of the distributor or dealer who sold him the car and who therefore has the greatest interest at stake in assuring his satisfaction. Nevertheless, he may feel perfectly free to use his car for extended travel without depriving himself of the service benefits to which he is entitled at his local service station. He will find other Authorized Cadillac-La Salle Service Stations able and willing to render the same service.

Service Card

As a means of introduction at other Authorized Cadillac-La Salle Service Stations, every purchaser of a Cadillac car is given credentials in the form of a Service Card. This card is mailed to him by the Cadillac factory immediately after the delivery of the car is reported by

the distributor or dealer. It is supplied in a celluloid case, and is intended to be carried in a holder provided on the rear face of the dash.

Upon presentation of this Service Card to any Authorized Cadillac-La Salle Service Station, the car owner is entitled to the following uniform standard service:

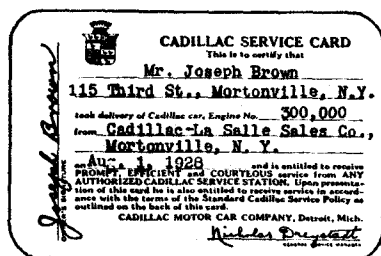


Figure 1. The Service Card, when properly signed, identifies a Cadillac owner at any authorized Cadillac-La Salle service station.

1. All adjustments free of all charges that may be required within 90 days after the original delivery date (as shown on the card), provided the mileage of the car does not exceed 3000 and the adjustments are not made necessary by accident, abuse or neglect. This includes everything except lubrication, washing and storing.

2. Free replacement of any part which has proved to the Cadillac Motor Car Company's satisfaction

to be defective in material or workmanship within one year after the delivery date, provided the mileage of the car does not exceed 12,000 and that the replacement was not made necessary by accident, abuse or neglect. This includes material and labor.

The Service Card is not transferable, and the no-charge service set forth above is effective only while the car is in the hands of its original owner.

Service Charges

Service work other than that described above is performed by Authorized Cadillac-La Salle Service Stations on a flat-rate basis. When a car enters the service station, it is immediately inspected by a tester, who then quotes the owner an exact price for the work he finds necessary. The owner authorizes the work at this price, and when he receives his bill, this is the price he pays.

Charges prevailing at Authorized Cadillac-La Salle Service Stations are based on standard schedules furnished by the Cadillac Motor Car Company. These schedules call for methods and tools approved by the same engineers who designed and built the car, assuring the highest quality of work at the lowest possible price. Standard Price Schedules are open to inspection by owners at any Authorized Cadillac-La Salle Service Station.

Repair Parts

Genuine Cadillac parts, manufactured to the same rigid specifications as the parts entering into the original assembly of the car, and carried in stock by Authorized Cadillac-La Salle Service Stations. They are sold at uniform prices throughout the United States, and are not subject to the addition of handling, excise or other supplementary charges. Printed price lists, published by the Cadillac Motor Car Company, are open to inspection by owners at any authorized Cadillac distributor's or dealer's establishment.

The Owner's Obligation

All of these service facilities are placed at the disposal of the Cadillac owner, in order that his car may be a continuous source of satisfaction and utility. This result cannot be guaranteed, however, unless the owner fulfills certain definite obligations himself, as follows:

1. To drive the car at moderate speeds for the first 500 miles.
2. To operate the car in accordance with the instructions contained in this manual.
3. To check the engine oil level every 100 to 150 miles, and add oil as often as necessary to keep the indicator at "full."
4. To check the tire pressure at least every week, and keep it up to the recommended pressure—40 pounds both front and rear—on cars driven at high speeds, 50 pounds in front.
5. To add distilled water to the storage battery every 1000 miles, and in warm weather every 500 miles, or at least every two weeks.
6. To lubricate the car every 1000 miles, in accordance with the lubrication schedule on page 40.
7. To take the car to an Authorized Service Station for inspection every 1000 miles, or at least once a month.

Lubrication

The first five items above are details which do not necessarily warrant a visit to the service station. For lubrication, however, the owner is urged to patronize Authorized Cadillac-La Salle Service Stations, because they are prepared to furnish this service in a manner that cannot be duplicated elsewhere. Only approved lubricants are used, the specifications of which have been worked out by Cadillac engineers to give the

best possible results. Workmen who specialize on Cadillac cars know exactly where lubrication points are located and how much lubricant to apply. The charge for this lubrication service over a period of 4000 miles is barely over half a cent a mile, which includes the cost of the lubricant.

Inspection

Preventive service is a fundamental principle of Cadillac Service. "Preventive service" is the practice of inspecting the car at regular intervals and making those adjustments that need attention before the need becomes an emergency. Inspections should be made every 1000 miles, in order to insure transportation satisfaction. Authorized Cadillac-La Salle Service Stations will make such inspections without charge, provided no dismantling of units is necessary.

The Cadillac owner is urged to take full advantage of this, not only while the car is new, but throughout its entire life.

Preventive service, rendered every 1,000 miles by an Authorized Cadillac-La Salle Service Station is the surest guarantee of long life and complete motoring satisfaction at the least possible expense.

CHAPTER II

Operation

ONE of the first things the driver of a new car should do is to familiarize himself with the various controls described in the following chapter.

Locks

Each car is equipped with two each of two different keys, one for the combination ignition switch and transmission lock and the door lock; the other for the tire carrier and the package compartments. The ignition key can be identified by its hexagonal end, while the package compartment key is oval.

The lock number is stamped on each key but not upon the face of the lock. The owner should make a record of the key numbers as soon as he takes delivery of his car, so that in the event both keys are lost, a duplicate key can easily be obtained from a Cadillac distributor or dealer.

Ignition Switch Lock

The lock at the lower right-hand side of the instrument panel controls both the ignition switch and the transmission lock. To unlock the car, insert the key and turn to the right. The cylinder of the lock will then slide out about half an inch, turning on the ignition and unlocking the transmission by means of a cable connection to the shifter shafts. To shut off the ignition and lock the transmission, simply push the lock cylinder all the way in. The car can be locked when the transmission is in neutral or in reverse. Do not attempt to shut off the ignition when the transmission is in any forward gear. Be sure to remove the key before leaving the car.

Gasoline Gauge

The gasoline gauge, marked "Fuel," is the lower dial in the center of the instrument panel (Fig. 3). This gauge indicates in gallons the quantity of fuel in the tank at the rear of the car, and is operated electrically. To read from the gauge the quantity of fuel in the tank, the ignition must be switched on.

When the ignition is switched off, the gauge hand may come to rest anywhere on the gauge. It does not usually return to zero, nor does it

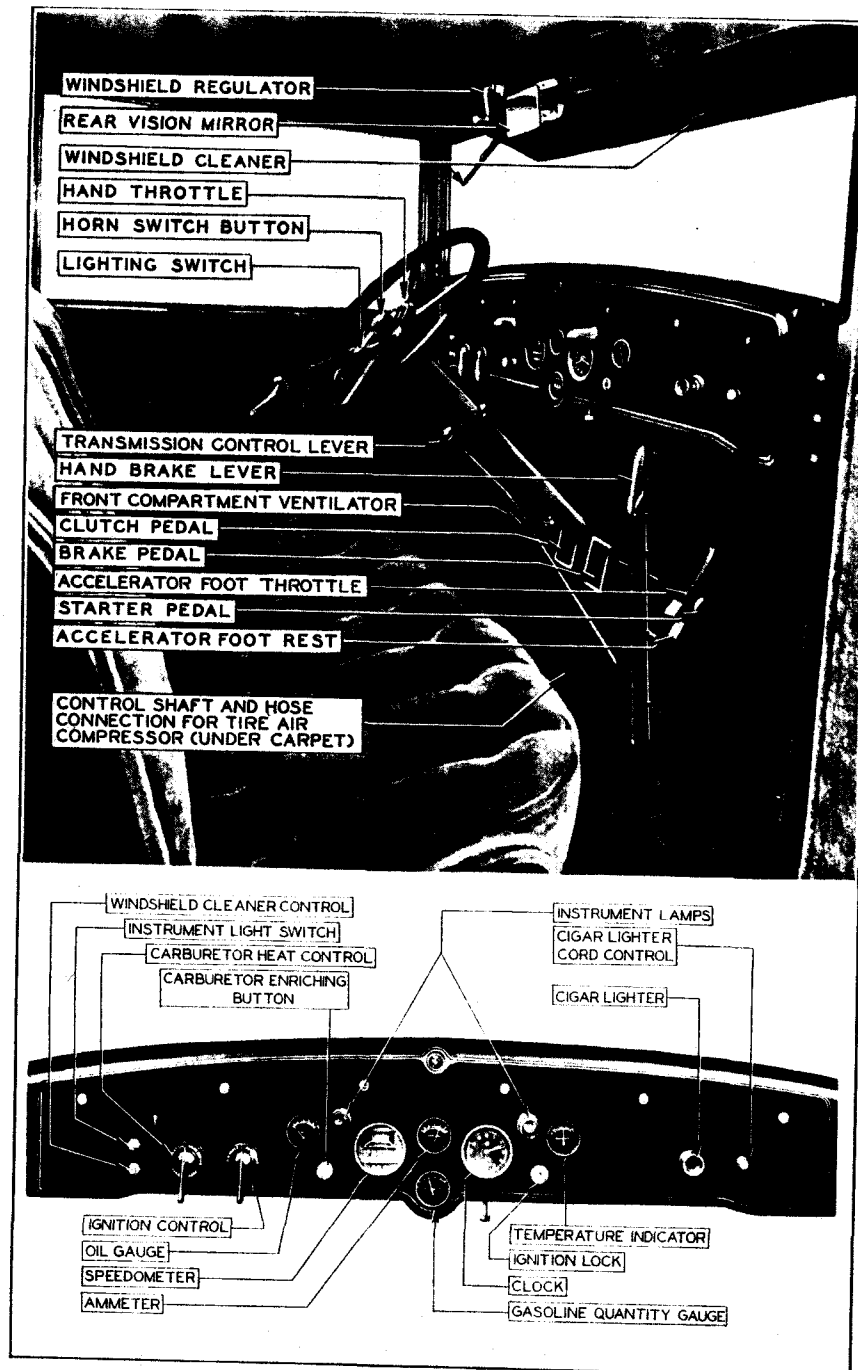


Figure 2. The new driver should familiarize himself with the instruments and controls before attempting to drive.

(10)

ordinarily stay in the position it had before the ignition was switched off. At such times, therefore, the reading of the gauge is not a true reading. A true reading is given only when the ignition is switched on.

As filling station rules forbid running the engine while the gasoline tank is being filled, on such occasions the ignition should be switched off until the engine stops and then switched on again, and left on while the tank is being filled.

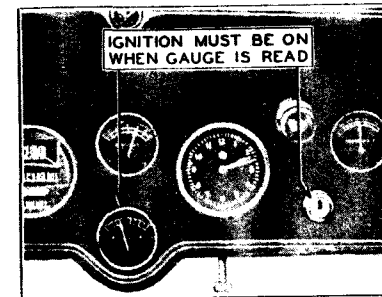


Figure 3. The gasoline gauge is operated electrically by current from the ignition circuit.

If the fuel supply should give out on the road, so that the vacuum tank on the dash becomes empty, it will be necessary after refilling the gasoline tank to prime the vacuum tank. To do this, close the throttle and hold the starter pedal down for 20 to 30 seconds. *The throttle must be closed while this is done.*

Temperature Indicator

The gauge at the extreme right of the instrument panel (Fig. 4) is a thermometer for indicating the temperature of the engine, and takes the place of a temperature indicator on the radiator. The bulb end of the thermometer is inserted in the water jacket at the rear end of the right-hand cylinder head, and is connected by a small tube to the dial on the instrument board.

The normal engine temperature after the engine becomes warm is 160° to 190° .

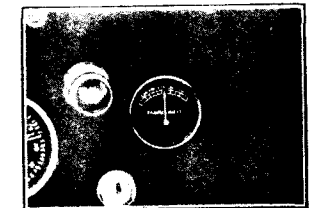


Figure 4. The temperature of the water in the cylinders should range from 160° to 190° .

Throttle Control

The power and speed of the engine are controlled by opening and closing a throttle valve in the carburetor. This throttle is operated both by a hand lever and a foot pedal.

The foot pedal, or accelerator, is at the right of the brake pedal (Fig. 2). The hand control is the upper lever above the steering wheel. Both controls operate the same throttle; the hand lever, however, remains in the

position to which it is moved, whereas the accelerator must be held down to keep the throttle open.

The normal position of the hand lever for driving the car is all the way up (at "Close"). In this position the throttle of the carburetor is open just enough to permit the engine to run at idling speed after it is warm. For starting, however, the lever should be moved approximately one-fourth the way down, and should be left in this position until the engine is warm enough to permit the lever to be returned to the idling position without stalling the engine. (Also see Chapter on "Cold Weather Operation.")

Ignition Control

Correct timing of the ignition in relation to the positions of the pistons is controlled automatically by the timer-distributor which provides for all ordinary advancing and retarding of the spark.

A hand control is also provided, however, for further retarding of the spark as occasion requires. The hand control is the right hand of the two levers on the instrument board directly in front of the steering column. When the pointer is all the way to the left the spark is fully advanced. When the pointer is all the way to the right, the spark is fully retarded.

The correct position of the hand control lever depends on the fuel used. Cadillac cars are equipped with what are known as high compression cylinder heads. These are cylinder heads in which the space into which the fuel mixture is compressed just before it is ignited is so proportioned that a higher pressure is obtained than with low-compression cylinder heads.

High-compression cylinder heads enable the engine to develop more power when used with anti-knock fuel. The ignition is so timed at the factory that when the hand control lever is fully advanced the engine will develop the maximum power possible with anti-knock fuel.

The high-compression cylinder heads do not prevent the use of regular fuel, but when regular fuel is used the spark must be retarded slightly to secure maximum power and prevent detonation or spark knock. The spark should then be retarded just to the point where the engine "pings" slightly on rapid acceleration. This slight amount of spark knock is absolutely harmless to the engine and is an indication to the driver that the spark is set at the point that will give maximum power and economy.

When once set, the spark control does not need to be changed unless the fuel is changed or unless the accumulation of carbon makes it necessary. Carbon deposit, which accumulates with use in all engines, also causes spark knock and in time may require setting back the spark. Regardless of the kind of fuel used or the presence of carbon, the correct setting of the

spark control at any time is at the point where the engine "pings" slightly on rapid acceleration.

CAUTION—If the engine is being cranked by hand the spark should always be fully retarded.

Carburetor Enriching Control

The button at the left of the instrument panel (Fig. 5) controls a device on the carburetor for temporarily enriching the fuel mixture supplied to the engine. When starting the engine, it is necessary to have the proportion of liquid gasoline in the fuel mixture greater than at other times, because in a cold mixture only a part of the gasoline is vaporized. Pulling out the enriching button increases the proportion of liquid gasoline to air, the normal proportions being restored when the button is released and permitted to return to its original position.

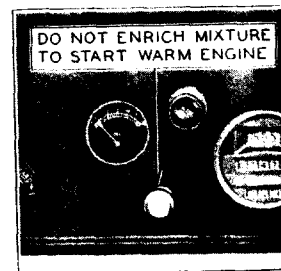


Figure 5. The carburetor enriching control does not prime the carburetor. To have any effect, it must be held out while the starter is cranking the engine.

Correct use of the enriching control not only is essential to quick starting of the engine, but also has an important effect on the life of the engine. The enriching button must be pulled out far enough in starting to provide an explosive mixture quickly so that the battery is not unnecessarily discharged by useless cranking. The button must also be held out far enough during the warming-up period so that the engine will run without missing and "popping back."

On the other hand, it should not be pulled out any further or held out any longer than is necessary to accomplish these results, because some of the excess liquid gasoline in the enriched mixture does not burn and washes off the oil on the cylinder walls, interfering with proper lubrication of the pistons.

If the engine still retains heat from previous running, the enriching control should not be used without first attempting to start the engine on the normal mixture. If the enriching button is pulled out for starting a hot engine, the mixture may be made so rich that starting will be impossible.

The enriching button is not a priming device. It has no effect whatever on the fuel or the fuel mixture unless the engine is being cranked or is running under its own power. To have any effect, the button must be pulled out and held partly out during the cranking operation.

Carburetor Heat Control

The lever marked "Carb. Heat" on the instrument board, directly in front of the steering column, controls the flow of exhaust gases through the jacket of the intake header which conducts the fuel mixture from the carburetor to the cylinders. This lever operates a valve at the front end of the left-hand exhaust manifold.

The lever should be turned to the "Heat On" position when starting the engine, and should be carried in this position for average driving. For continuous driving at high speeds, the lever should be turned to "Heat Off." This is important, for the maximum power of the engine cannot be obtained with the valve in the exhaust manifold closed.

Starter Pedal

The starter pedal is at the right of the accelerator (Fig. 2). Pushing this pedal forward brings into action the electric motor that cranks the engine for starting. Do not push the starter pedal when the engine is running.

The starter pedal is only one of the controls that must be manipulated to start the engine. Unless there is an explosive mixture in the cylinders and a spark to ignite it, it is useless to crank the engine. The starter pedal should not be operated, therefore, until the necessary preliminary steps have been taken. The following, in their proper order, are the various steps that must be performed to start the engine.

1. Make sure that the transmission control lever is in neutral.
2. Place the throttle lever about one-fourth the way down from the idling position.
3. See that the carburetor heat control lever is all the way toward "Heat On."
4. Switch on the ignition.
5. Unless the engine is still warm, pull back the carburetor enriching button and hold it back. If the engine is still warm, do not pull back the enriching button unless the engine fails to start on the normal mixture.
6. Push the starter pedal forward and hold it until the engine starts. Release it immediately as soon as the engine starts. (See below for probable causes for the engine failing to start.)
7. Let the carburetor enriching button partly in as soon as the engine starts, and all the way in as soon as the engine is warm enough to permit it.
8. Note whether pressure is indicated on the oil pressure gauge and stop the engine at once if no pressure is indicated.
9. Move the throttle lever up to the idling position as soon as the engine is warm enough to permit it.

In cold weather, disengage the clutch before pressing down the starter pedal, and hold it down during the cranking operation. This relieves the starter of the necessity of turning the transmission gears which are immersed in lubricant. The additional load is small in warm weather when the lubricant is thin, but in cold weather the power required to turn the gears through the thickened lubricant adds unnecessarily to the demand upon the battery.

What To Do If the Engine Fails to Start

If the engine fails to start after being cranked for a few seconds, release the starter pedal and investigate the following possible causes:

The ignition may be switched off.

There may be no gasoline in the tank in the rear of the car.

There may be no gasoline in the vacuum tank on the dash. If the vacuum tank should be empty, prime it by closing the throttle, and with the ignition switched off, holding the starter pedal down for 20 to 30 seconds. The throttle must be closed while this is done. Then open the throttle, switch on the ignition, and try again to start the engine in the usual manner.

The carburetor may be flooded by unnecessary use of the enriching device when the engine is warm. To get rid of this surplus gasoline in the carburetor, open the throttle wide, and, with the ignition switched off, hold the starter pedal down for 10 to 15 seconds. Then return the throttle lever to the usual position for starting, switch on the ignition and try again to start the engine.

Oil Pressure Gauge

The small dial at the left-hand end of the instrument panel (Fig. 6) is the oil pressure gauge. This gauge does not indicate the quantity of oil in the engine. It indicates only the pressure under which the oil is forced to the engine bearings.

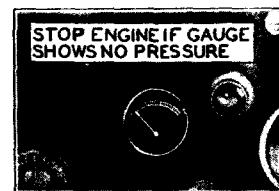


Figure 6. The oil pressure gauge does not show how much oil is in the engine—it shows pressure only. The pressure when the engine is idling should be 7 to 10 pounds.

When the engine is not running, the pointer on the oil pressure gauge should remain at zero, but as soon as the engine is started and as long as it runs, the gauge should show pressure. If the gauge does not show pressure when the engine is running, stop the engine at once and determine the cause. Serious damage may be done if the engine is run without oil pressure.

The amount of pressure indicated by the gauge depends upon the speed of the engine and the viscosity of the oil. At idling speed with fresh oil of the correct viscosity, the oil pressure after the engine is warm should be 7 to 10 lbs. Before the engine is warm, the pressure will be higher. After the oil has become thin the pressure will be lower. These are normal variations from the standard and do not indicate need for attention.

Clutch Pedal

The clutch pedal is the left-hand pedal. When this pedal is in its normal or released position, the clutch is engaged. The flywheel of the engine is then coupled to the transmission. When the clutch pedal is pushed down, the clutch is disengaged, and the flywheel, if the engine is running, revolves independently of the transmission.

The clutch has two uses: First, to enable the car to be started gradually and without jerk or jar; second, to permit shifting of the transmission gears. The operation of the clutch pedal is discussed below in connection with the transmission control. Further comment is unnecessary at this point, except the following suggestions to the driver:

Do not drive with the foot resting on the clutch pedal. The Cadillac clutch operates so easily that even the weight of the driver's foot may unintentionally cause the clutch to slip.

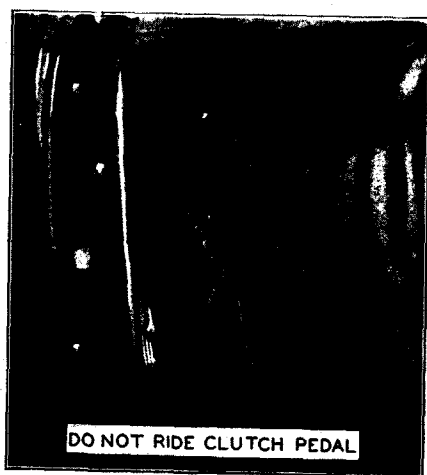


Figure 7. A good driver uses the clutch pedal only when shifting gears or about to stop.

Do not form the practice of disengaging the clutch whenever the brakes are applied. Most occasions for use of the brakes require only slowing down without stopping or even shifting gears. A skilled driver will not touch the clutch pedal until the car is just about to stop or until he is about to shift to a lower gear. It is a mistaken idea that applying the brakes with the clutch engaged is more severe on the brake lining. The opposite is actually the case, proof of which is in the fact that in coasting down grades, the resistance of the engine is used to assist the brakes in controlling the car speed.

It will be observed in operating the clutch pedal that the pedal offers almost no resistance until it has been moved about one inch. It is at this point that it actually begins to disengage the clutch. It is important that the pedal have this "lost motion." If the full pressure of the clutch springs is felt just as soon as the pedal is moved, the control rod should be readjusted. Failure to make this adjustment will result in the clutch slipping.

Transmission Control

The operation of the Cadillac Syncro-mesh transmission is, in general, the same as the operation of the conventional selective sliding-gear type of transmission. The positions of the control lever for the various speed combinations are the same and the directions in which the control lever is moved are the same. It is also necessary to disengage the clutch before moving the control lever, the same as with the conventional transmission.

The only difference is in the manner of moving the control lever. With the conventional transmission, it is customary when shifting to a higher gear to hesitate momentarily in neutral and then move the lever quickly to its new position.

With the Cadillac Syncro-mesh transmission there is no necessity either for the hesitation in neutral or for the rapid movement of the lever during the latter part of the shift. Instead, the movement of the control lever should be one smooth, continuous movement.

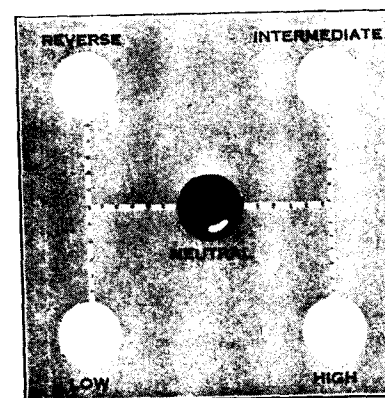


Figure 8. The positions of the control lever are the same as for the conventional type of transmission.

Without giving a detailed explanation of the synchronizing mechanism, it may be said that its purpose is to secure noiseless shifting of the control mechanism by automatically synchronizing (or equalizing) the speeds of the two members which are to be coupled together, before the shift is made.

This synchronizing effect is brought about by a pair of friction clutches of simple cone-type, which are actuated by the control lever through a cam mechanism. As the control lever leaves the neutral position, it engages one or the other of these clutches just long enough to synchronize the two members, so that when the final movement of the control lever

is made, the teeth which interlock to take the drive are traveling at exactly the same rate of speed.

The synchronizing principle applies to all shifts into intermediate or high; in other words, to the following shifts:

Low to intermediate

Intermediate to high

High to Intermediate

There is no synchronizing mechanism for low or reverse gears because shifts into these gears are usually made when the car is standing still. When shifting from neutral to low or reverse, therefore, it may be necessary to await an instant after disengaging the clutch, to give the gears a chance to stop "spinning." Do not attempt to shift from intermediate to low unless the car is standing still or moving very slowly.

If, when descending a grade at high-speed, it becomes desirable to shift from high to intermediate, in order to use the engine as a brake, re-engage the clutch slowly after making the shift. This will bring the engine up to speed gradually and avoid the sudden load that would otherwise be imposed upon the clutch.

The ease and certainty with which a noiseless shift can be made with the new transmission, may tempt some drivers to perform "stunts" for which it is not intended. The synchronizing principle makes it possible for the driver to make use of intermediate speed at any time that it is an advantage to do so, without having to worry whether he will get "into gear" successfully. There is no advantage to be gained, however, in using intermediate at speeds above 30 miles per hour, and any attempt to shift at higher speeds should be regarded as abuse.

Coasting

To coast on the level, simply release the accelerator pedal and disengage the clutch. If coasting to a stop, the transmission control may also be shifted to neutral and the clutch re-engaged.

In coasting down grades, however, it is recommended that the transmission be left in gear and the clutch engaged. With the throttle in the idling position, the car is thus made to drive the engine, the resistance of which assists the brakes and saves wear on the brake lining. It must be remembered that the brakes are subjected to much more severe use on grades than on the level, because gravity acts continuously, whereas on the level, the brakes need absorb only the momentum of the car. Even on slight grades, coasting with the transmission in neutral or the clutch disengaged is not

advisable. On any grade steep enough to warrant coasting, it is worth while to save the brakes as much as possible by utilizing the braking effect of the engine.

Ordinarily, the resistance offered by the engine when the transmission is in high is sufficient to control the speed of the car, supplemented by moderate use of the brakes. On steep grades, however, the transmission control should be shifted to intermediate.

Do not switch off the ignition when coasting with the car driving the engine. Contrary to a common impression, this does not appreciably increase the resistance, and is likely to cause damage to the engine. Even with the throttle closed, some fuel is admitted to the cylinders, and if this is not burned, it condenses on the cylinder walls and washes off the oil by which the pistons are lubricated.

Brakes

The foot brakes, operated by the right-hand pedal, are internal brakes of the shoe type, applied on all four wheels through a mechanical linkage.

The front wheel brakes are designed so that, if applied while the steering wheel is turned to the right or left, only the brake on the inside wheel is effective and the brake on the outer wheel is released, leaving it free to rotate. It is thus impossible to lock both front wheels, even on slippery pavement, unless the car is moving straight ahead.

Gradual application of the brakes will provide sufficient stopping power and will result in less strain on the mechanism, so the brakes should not be applied suddenly except in an emergency. This is particularly true in crowded traffic, for a vehicle following may not have such efficient brakes.

When applying the brakes on wet asphalt streets or slippery roads, do not disengage the clutch until the car is almost stopped. Do not attempt sudden stops. Cadillac four-wheel brakes minimize the possibility of skidding under these conditions, but their effectiveness should not induce anyone to drive less carefully.

As the brake lining wears, the pedal must be pushed farther down to apply the brakes. Do not wait until the pedal goes all the way to the floor board before having the brakes readjusted. Readjustment is recommended as soon as the pedal must be pushed down to within one inch of the floor board. A temporary adjustment of the foot brakes is explained on page 53.

The hand brakes, which consist of separate internal brake shoes on the rear wheels, are operated by the hand lever at the right of the transmission control lever.

Speedometer

The lower dial of the speedometer, which is for recording "trip" mileage, can be reset to zero by pushing up and turning the knurled stem back of the instrument board.

Across the speedometer cover glass and below the total mileage dial is a strip of black celluloid on which are two white spaces. These spaces are for the lubrication notice described on page 39 in connection with the lubrication schedule. Use this notice in accordance with the schedule.

An automobile repairman should never be permitted to attempt to adjust or repair the speedometer head or to replace the glass. This work can be done only by men experienced in speedometer work and only with special machinery and tools. If the speedometer head is removed, handle it as carefully as a fine watch. The speedometer head may easily be damaged by rough handling.

Ammeter

The upper dial on the instrument panel (Fig. 9) is the ammeter, which measures the electric current flowing to or from the battery at all times, except when the starter is cranking the engine. When current is flowing from the battery, the ammeter shows a reading on the side marked "Discharge;" when current is flowing to the battery, the ammeter is on the "Charge" side.

The ammeter should indicate on the "Charge" side most of the time. Otherwise, more current will be taken out of the battery than is put into it and the battery will eventually become fully discharged. When the engine is not running, the ammeter will indicate a current on the discharge side, depending in amount upon the number of lights in use. The rate of charge or discharge when the engine is running depends upon the speed of the engine and the number of lights in use, and is equal in amount to the difference between the current generated and the current used by the lights, horn, ignition and other electrical devices.

Ordinarily, when no lights are in use, the ammeter should show "Charge" as soon as the car is running ten or twelve miles per hour in high gear. If the ammeter should show "Discharge" with all lights off, either when the engine is not running or when the car is running more than twelve miles per hour, the cause should be investigated.

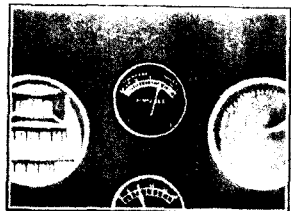


Figure 9. The ammeter indicates the amount of electrical current flowing to or from the battery.

Lighting Switch

The lighting switch control is at the upper end of the steering column in the center of the steering wheel. The lever has three positions besides "Off." These positions are marked respectively: "Parking," "Down," and "Up." The corresponding combinations of lights are as follows:

Parking—Parking lights (dim), and rear lamp.

Down—Headlamp lower beams (bright), and rear lamp.

Up—Headlamp upper beams (bright), and rear lamp.

The headlamp bulbs have two filaments, one above the other, instead of the customary single filament. Both filaments are of the same candle-power (21), but because they are located in different positions with respect to the reflector, the beam of light from one filament is projected at a different angle from the other. When the switch lever is at "Up," one set of filaments is lighted and the beams are projected straight ahead, illuminating the road at a distance. When the lever is at "Down," the other filaments are lighted and the beams are projected down at an angle, illuminating more brightly the road directly in front of the car.

The practice to be followed by the driver in using this double-beam feature of the headlamps will depend upon local regulations. In general, it is expected that the upper beams will be used except on the following occasions: When passing a vehicle approaching from the opposite direction, when rounding a sharp curve and when topping the crest of a hill. On these occasions, and at other times when illumination is desired directly in front of the car, the lower beams should be used.

The instrument lamps are controlled by a separate switch at the left-hand end of the instrument board.

Danger of Running Engine in Closed Garage

Every person having to do with the operation or care of a motor car should be warned of the danger that attends running the engine while the car is in a small closed garage.

Carbon monoxide, a deadly poisonous gas, is present in the exhaust of all internal combustion engines. Most people are already familiar with carbon monoxide in the form of illuminating gas, or in the gas produced by furnaces and stoves when insufficient air is supplied to give complete combustion. But illuminating gas and coal gas have unpleasant odor, which serves as a warning, whereas carbon monoxide, as produced in the internal combustion engine, is colorless, tasteless, and almost odorless, so

that the victim may be overcome before he is aware of the danger. When the engine exhausts into the open air, the carbon monoxide is so diluted that it has no effect. It is when the engine is run for a time in a closed room that the proportion of carbon monoxide in the air may increase to the point at which continued breathing of it would be fatal. The United States Public Health Service advises that the average automobile engine warming up in a single-car garage will give off enough carbon monoxide in three minutes to endanger life.

Proper precaution must be taken in cold weather when the natural tendency is to keep the garage doors and windows closed. The practice of letting the engine warm up in a closed garage before opening the doors is unsafe. The risk is made greater by the fact that the enriching of the mixture by manipulation of the carburetor enriching device increases the amount of carbon monoxide formed.

CHAPTER III

EQUIPMENT

THE controls and instruments used in driving have already been described. In addition to these, the car is equipped with various devices which are for the convenience and comfort of the occupants, and are used only as occasion demands. It is suggested that the driver anticipate his use of such equipment by becoming familiar at once with the directions contained in this chapter.

Windshield and Ventilation

CLOSED CARS—Cadillac closed cars are equipped with a one-piece windshield, which can be moved up and down. Movement of the glass is controlled by a handle above the windshield. To raise the glass, the handle should be turned clockwise, and to lower the glass, the handle should be turned counter-clockwise.

For ventilation under the cowl, the windshield should be raised not more than one inch, so that the lower edge of the glass is still below the ledge over the instrument board. With the windshield in this position, air is deflected into the driving compartment through an opening in the cowl, just forward of the instrument board. If desired, the windshield can be raised above the level of the ledge over the instrument board, and air will then enter directly into the car. In this position, however, less air will be forced down under the cowl. (Fig. 10.)

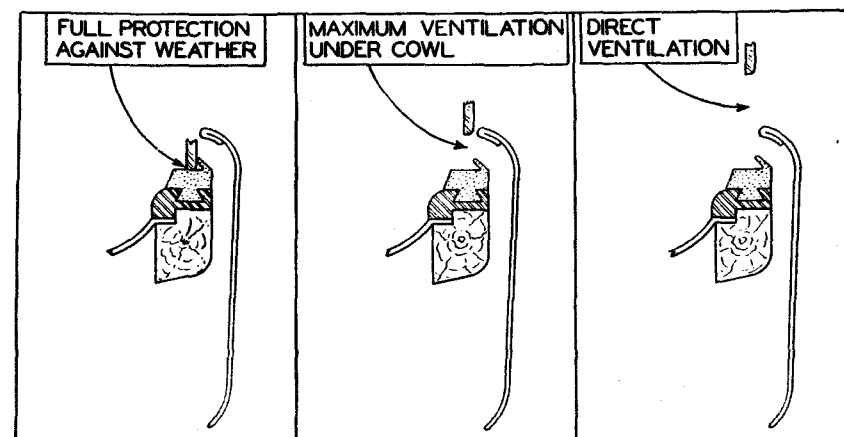


Figure 10. The closed car windshield has three positions: the position shown in the center is best for warm weather.

Cowl ventilators are also provided on the closed cars to supplement the ventilation provided by the windshield. These ventilators are at the sides of the cowl compartment and open toward the rear, serving as outlets for the air entering under the windshield.

OPEN CARS—Cadillac open cars are equipped with two cowl ventilators which are operated by levers just in front of the instrument board.

The open car windshield is in one section, which is pivoted at both the upper and the lower corners. To fold the windshield outward, loosen the wing nuts and tighten them again after the windshield is in the desired position.

Windshield Cleaner

The windshield cleaner consists of two wiper blades driven by an electric motor. The cleaner is controlled by the switch button at the extreme left-hand end of the instrument board. To start the cleaner, pull out the switch button.

Adjustable Seat

The driver's seat is adjustable on all Cadillac cars, except those that are intended to be chauffeur-driven. On open cars, the back of the seat can be moved forward or backward as desired. This adjustment is controlled by the handle on the top of the back of the seat. To move the seat forward, turn the handle clockwise; to move it backward, turn the handle counter-clockwise.

On closed cars, the entire front seat can be moved forward or backward. This adjustment is controlled by a handle on the center of the seat, about three inches above the floorboards. To move the seat forward, turn the handle clockwise; to move it backward, counter-clockwise. The handle must be turned one-half turn at a time.

As the front seat on the five-passenger coupe is divided, only the driver's half of the seat is adjustable. The handle for making the adjustment is on the side of the seat, otherwise the adjustment is the same.

Cigar Lighter and Inspection Lamp

The car is equipped with a combination cigar lighter and inspection lamp that makes use of a single reel with twelve feet of flexible cord attached to the back of the instrument board. The flexible cord ends in a bayonet type socket, to which may be attached either the inspection lamp or the heating element of the cigar lighter. The method of attachment is identical with that of an ordinary lamp bulb. Ordinarily the cigar lighter

will be carried in place in the socket on the cord and the inspection lamp in a stationary socket provided on the front of dash, where it is useful to illuminate the engine. (The inspection lamp is packed with the tool equipment when the car is shipped.)

To use the cigar lighter, pull it out from the instrument board at least a foot, wait a few seconds for the heating element to heat and apply it to the cigar or cigarette. The current is automatically switched on as soon as ten or twelve inches of the cord have been unreeled. To light a pipe, remove the nickel-plated shield by turning it slightly counter-clockwise and pulling it straight off.

To lock the cord in any desired position, pull out the button on the instrument board at the right of the cigar lighter (Fig. 2). This engages a ratchet which prevents the reel from rewinding. To rewind the cord, press the button back to its original position.

The inspection lamp socket on the dash has a double bayonet lock with two sets of slots. To install the lamp, simply insert it in the socket, press in, and turn it clockwise as soon as the pins on the lamp engage the first or outer sets of slots. In this position, the current is not switched on. To switch the current on, turn the lamp slightly counter-clockwise, press in, and turn it clockwise again, engaging the pins in the second or inner set of slots. To switch off the light, turn the lamp counter-clockwise and pull it out of the socket far enough to engage the first set of slots.

Top and Side Curtains

Top

Illustrated directions for folding and raising the top on open cars are given in Fig. 11.

Side Curtains on Open Cars

The side curtains, with which the open cars are equipped, are carried in an envelope provided with cloth partitions to prevent rubbing and chafing. The side curtains on the touring car are stowed under the front seat. On the phaeton and roadster, they are stowed in a special compartment back of the front seat.

The touring car and phaeton curtains are in six sections, each of which is marked to indicate its position, as "Left Front," "Right Center." The front and center sections on both sides are each provided with a rod, the lower end of which fits in a socket in the top of the door. When a curtain



Figure 11a. Remove the caps indicated by the arrow.



Figure 11b. Install the top supports by pushing them into the sockets and tightening the small cap screws. The supports appear like this when properly in place.

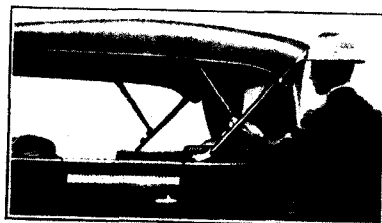


Figure 11c. Detach the side quarter curtains from the bow sockets and fold the curtains back against the rear curtain.

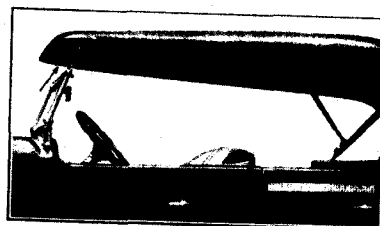


Figure 11d. Unscrew the thumb screws over the windshield supports and push the top up so that the clamps are free from the supports.

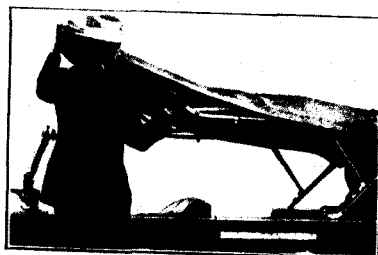


Figure 11e. Stand on the running board and pull down on the front bow socket just ahead of the joint, at the same time pushing the front part toward the rear.



Figure 11f. Fold the top back, allowing the upper fabric or deck to fall back clear of the bows.

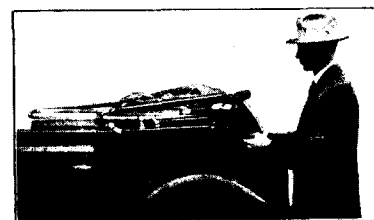


Figure 11g. Tuck the deck down under the bows, carefully smoothing out the material between the bows.

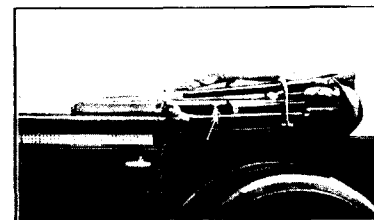


Figure 11h. Make sure that the hooks (see arrow) engage the slotted brackets on the rear bow sockets. Fasten the bows down to the supports with the clamps as illustrated.

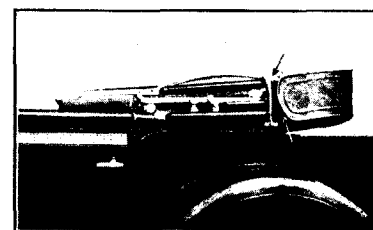


Figure 11i. Draw the dust boot over the folded top. It is secured by four straps (see arrows) at the open corners. These straps should be fastened around the bows and pulled tight to keep the boot smooth. The boot should look like this when properly strapped in place.

To raise the top, remove the dust boot and unfasten the support clamps. Then stand in the tonneau and lift up the front bow. Pull the top up and over, making sure that the joints in the front bow close on both sides. The front end of the top will then be directly over the windshield as in Fig. 11d. Attach the clamps to the windshield supports and tighten the thumb screws. Re-fasten the side quarter curtains to the rear bow sockets.

Figure 11. Folding and Raising Top.

is folded for stowing, this rod is parallel with the bottom of the curtain, as shown in Fig. 12. Before the curtain can be attached to the door, the rod must be moved to the position shown by the dotted lines. The upper

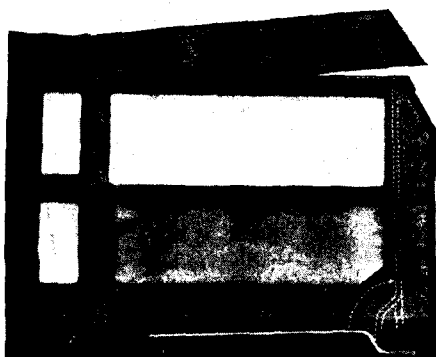


Figure 12. Side Curtain.

end of the rod is slotted to engage with the stiffener that runs along the upper edge of the curtain.

The folding flap on the door curtains has the upper rear corner cut off diagonally. This is to permit its being tucked through on the outside when the flap is closed. By tucking the flap this way, the wind is prevented from blowing in at the rear of the flap.

The rear sections should be applied first, followed by the center and front sections. The rear sections should be fastened to the rear bows under the side flaps of the permanent rear curtains.

Before stowing the curtains, they should be dry and clean.

Curtain Fasteners

The curtain fasteners used on the top and side curtains are of three different types. The type used on the side curtains at the points where they fasten to the body is illustrated in Fig. 13b. To release this type of fastener, press in on the small plunger or button in the center of the fastener.



Figure 13. Three types of fasteners are used on the top and side curtains. The way to unfasten each is shown above.

At other points, the fastener as illustrated in Fig. 13a is used. When this type of fastener is snapped on its stud, it becomes locked on three sides. To release this type of fastener, it must be

lifted on the side that is not locked. This side is indicated by the small projection to which the arrow points in Fig. 13a. This type of fastener cannot be released by lifting it at any other side.

The remainder of the fasteners used on the top and side curtains are of the usual glove type. (Fig. 13c.)

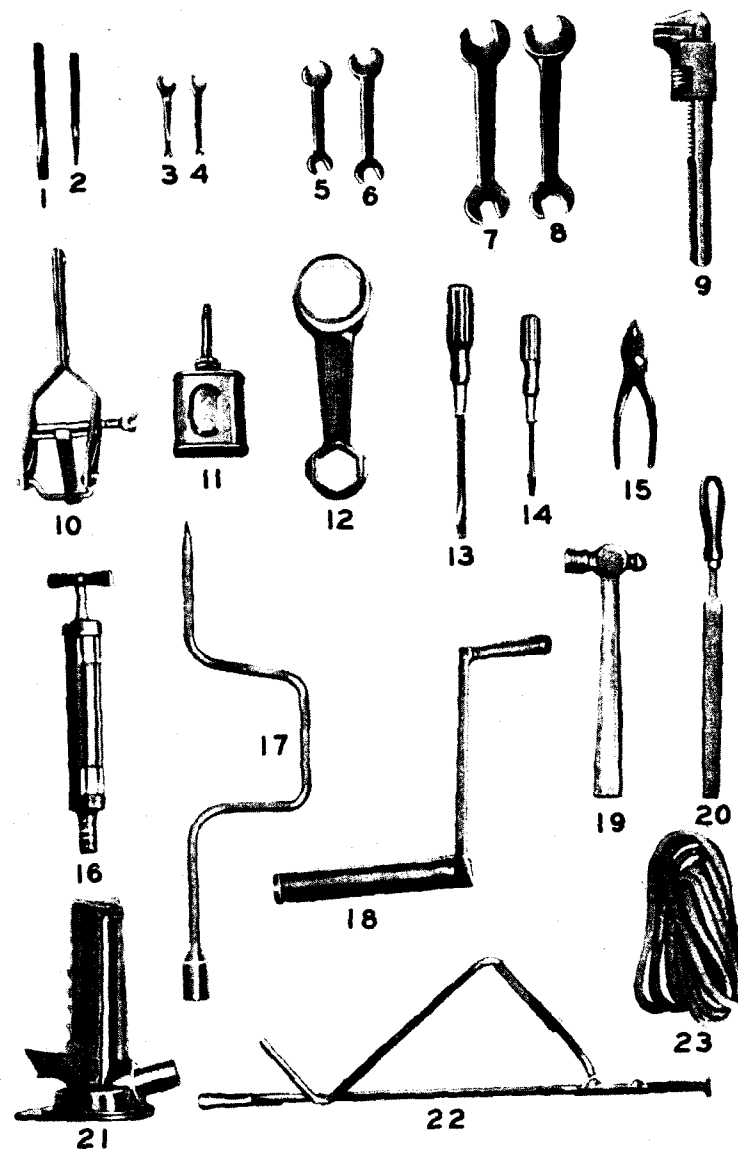


Figure 14. The standard tool equipment. See page 30 for the name and use of each tool.

Tools

The tools comprising the standard equipment are listed below and are illustrated in Fig. 14. Items listed opposite Nos. 24, 25, 26 and 27, are not illustrated.

- | | |
|--|---|
| 1. Cold chisel | 15. Pliers |
| 2. Center punch | 16. Grease gun |
| 3. Distributor wrench (with gauge for adjusting timer contact points and spark plugs). | 17. Wrench for rim clamping nuts |
| 4. Distributor wrench (plain) | 18. Hand starting crank |
| 5. Open end wrench $\frac{7}{8}$ - $\frac{1}{2}$ | 19. Hammer |
| 6. Open end wrench $\frac{7}{8}$ - $\frac{9}{8}$ | 20. File |
| 7. Open end wrench $\frac{3}{4}$ - $\frac{13}{8}$ | 21. Jack |
| 8. Open end wrench $\frac{7}{8}$ - $1\frac{1}{8}$ | 22. Jack handle |
| 9. Monkey wrench | 23. Hose for tire air compressor |
| 10. Rim Tool | 24. Inspection lamp. Note: The inspection lamp is packed with the tool equipment when the car is shipped but is ordinarily carried in the socket provided for it on the dash. |
| 11. Oil can | 25. Tool bag |
| 12. Hub cap wrench | 26. Lubrication chart |
| 13. Large screw-driver | 27. Operator's Manual |
| 14. Small screw-driver | |

Tool Compartment

The compartment for the tool equipment is between the left-hand running board and the frame, and is accessible upon opening a door in the left-hand dust shield. The lock on the tool box door is operated by the key for the spare tire and package compartments, not by the ignition key.



Figure 15a. The tool box door can be unlocked with the package compartment key.

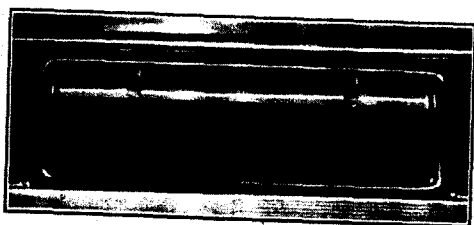


Figure 15b. A retaining rod holds the inner cover of the tool box in place.

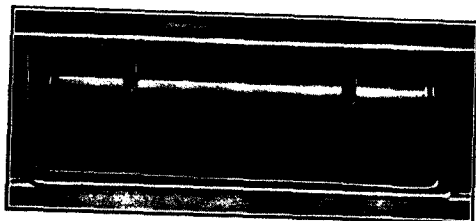


Figure 15c. The inner cover can be removed after the retaining rod is dropped down.

To reach the tools, proceed as follows: Insert the key and turn it clockwise until the lock barrel springs out. The handle can then be turned until the catches are released, permitting the door to be tilted out at the bottom and lifted out clear of the dust shield.

The tools are contained in an inner box, which is held in place by the rod shown in Fig. 15b. Force this rod out of the depressions in the handles on the cover of the box, and let the rod drop to the position shown in Fig. 15c. The cover of the box can then be removed by means of the two handles.

The door of the battery compartment operates in the same manner as the tool compartment.

Tires

Tire Valve Caps

The valve caps used with some makes of tires are a combination dust and valve cap. This type of cap can be removed and installed without screwing the cap the entire length of the threads on the valve stem.

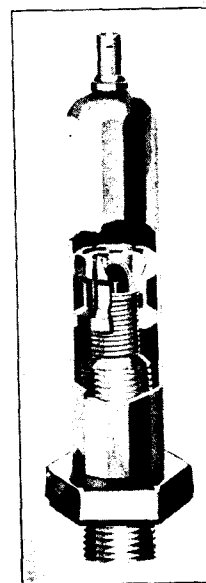


Figure 16. Tire valve cap.

To remove one of these valve caps, turn it two or three turns counterclockwise. This loosens the sliding nut inside the cap. (Fig. 16.) Next, pull the cap up as far as it will go. Then remove the cap by unscrewing it the rest of the way.

To install a valve cap, place the cap over the valve stem and turn it a few turns clockwise to engage the threads in the sliding nut. If the sliding nut is too far inside the cap to be reached by the valve stem, shake the nut down by tapping the bottom of the cap on some solid object. When the valve stem has been started in the sliding nut, push the cap down over the stem as far as it will go. Then turn the cap until it locks tightly.

Inflation Pressure

For normal driving, the tires should be inflated to a pressure of 40 lbs. per square inch. The inflation pressure should be checked at least weekly, and should never be permitted to drop more than 5 lbs.

On cars driven at high speeds, the front tires should be inflated to 50 lbs. This is important.

Tire Air Compressor

To use the tire air compressor with which the car is equipped, proceed as follows:

Turn back the left-hand side of the front carpet and lift the small oval-shaped cover which is in the floor, just to the left of the transmission control lever. Reach through the hole in the floor and remove the knurled cap from the connection on top of the compressor. Connect one end of the air hose (in the tool equipment) to this connection and at the other end of the hose to the valve of the tire to be inflated. Do not connect the hose to the tire first, if there is pressure in the tire.

The control shaft, by which the compressor driving gear is placed in mesh with the transmission gears, projects through a small hole in the floor, just in front of the large hole over the compressor. To start the compressor, if the engine is running, disengage the clutch and hold the pedal down until the transmission gears have ceased to revolve. Then, with a screw-driver, turn the slotted head of the compressor control shaft clockwise. If the engine is not running, simply turn the control shaft clockwise, without disengaging the clutch and then start the engine.

The compressor gives best results when the engine runs at a speed of approximately 1000 r.p.m., which is about three times the normal speed of the engine when idling. Do not race the engine in operating the compressor, or, for that matter, at any other time when it is not driving the car. Racing the engine beyond the recommended speed not only decreases the efficiency of the compressor, but is one of the worst forms of abuse. To stop the compressor, turn the control shaft counter-clockwise.

Do not turn the compressor control shaft to start the compressor when the engine is running and the clutch is engaged.

Tire Carrier

The tire carrier is designed to carry either one or two standard-size tires mounted on rims and inflated. Each

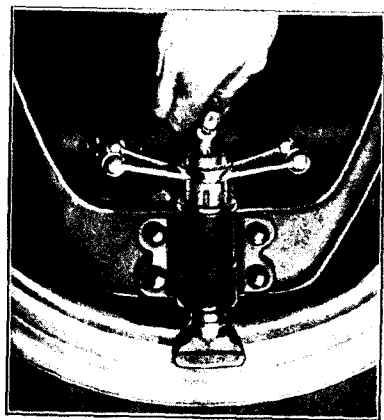


Figure 17. The spare rim and tire can be removed after unlocking the clamp and unscrewing it.

rim has on it three lugs, which are located so as to engage with notches on the support arms and on the adjustable clamps. There are two sets of these notches in the support arms.

When two rims are carried, the rim nearest the car should be placed so that the side with the lugs is away from the car, and the lugs should be inserted in the inner set of notches. The outer rim should then be placed so that the side with the lugs faces toward the car and the lugs of this rim should be inserted in the outer set of notches.

When only one rim is carried, the side of the rim with the lugs should face away from the car, and the lugs should be inserted in the outer set of notches. This permits the rim to be clamped by the outer clamp.

The lock is in the upper end of the outer clamp screw and is protected by a dust cap, which must be unscrewed to insert the key. Turning the key clockwise disengages the lock, permitting the clamp screw to be turned.

To lock the outer clamp, screw the clamp down firmly against the rim or rims. Adjust the clamp screw handle so that it points squarely across the car. Then turn the key counter-clockwise. Care should be exercised in removing or replacing a spare tire not to strike the body of the car.

NOTE: If a wrap-around type tire cover is used, it should have slots cut in it opposite the two upper lugs on the rim, so as to permit these lugs to seat in the notches in the support arms.

Wire Wheel Carrier

To remove the spare wire wheel from the carrier, first unscrew the dust cap which protects the lock. Insert the key in the lock and turn it to the



Figure 18. After unlocking the lock, the large nut holding the wire wheel can be unscrewed with the hub cap wrench.



Figure 19. The clamp over the disc wheel can be unscrewed by hand after it is unlocked.

right. Then unscrew the large nut, using the hub cap wrench. The wheel can then be taken off the carrier.

When installing the wheel on the carrier, tighten the nut as far as it will go. Then insert the key and turn it to the left.

Disc Wheel Carrier

To remove the spare disc wheel, unscrew the small dust cap and unlock the carrier by turning the key to the right. Then unscrew the large clamp, removing the large dust shield. The wheel can then be taken off the carrier, after unscrewing the cap nuts by which it is fastened.

When installing a wheel on the carrier, tighten the clamp and lock it in place by turning the key to the left.

Lock for Spare Tires on Fenders

When the spare tires or wheels are carried on the fenders, a lock is provided for each wheel or tire. This lock is fastened to the fender and must be removed before the tire or wheel can be removed. To remove the lock, insert the key and turn it to the right. The lock can then be lifted out.

When mounting spare tires in fenders, they should be deflated slightly before being put in the fenderwell, and should be fully inflated after they are in position. By following this method, a snug fit is secured, and the tires or tire covers are prevented from chafing.

Truing Up Rim

If a rim on a wood wheel does not run true, it may be trued up in the following manner: Rotate the wheel slowly and mark the part that runs farthest out from the face of the wheel. Loosen slightly the nuts diametrically opposite the mark, and then tighten the nuts on the marked side. Test the wheel again, and if it still does not run true, repeat the operation.



Figure 20. When spare tires are carried on the fenders, the lock must be removed from the fender before the spare tire can be removed.

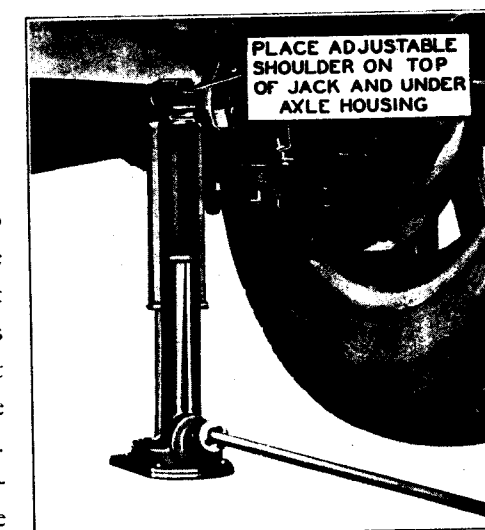
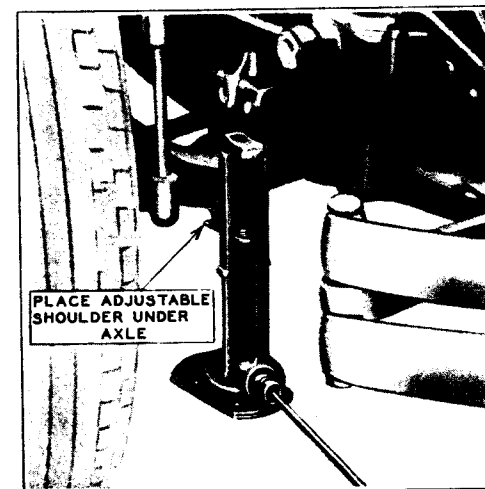
Use of Jack in Changing Tires

When a tire is "flat," the axle is not always far enough above the ground to permit placing the jack directly under the axle. It is then necessary to make use of the adjustable shoulder which engages with teeth on the side of the jack.

The illustrations in Figure 21 show how the adjustable shoulder should be placed under the axles.

Changing Tires

If an inflated tire is always carried on the spare rim or wheel, the driver will seldom or never have to disassemble a tire from the rim. In case of tire trouble, it is then merely necessary to remove the rim or wheel with the flat tire and then install the spare in its place. Illustrated directions for performing this work on wood, wire and disc wheels are given on pages 36, 37 and 38.



Tire Balancing Marks

The tires are balanced to offset the weight of the valve stem. If a tire is removed, it must be re-installed in its original position with respect to the rim; otherwise the tire and wheel will be unbalanced.

A small red square is accordingly branded in the rubber on the side of each tire. This mark must always be in line with the valve stem.

Figure 21. To jack up the car, it is necessary to have the jack in the proper position under the axle. The correct position for the front axle is shown above and for the rear axle, below.

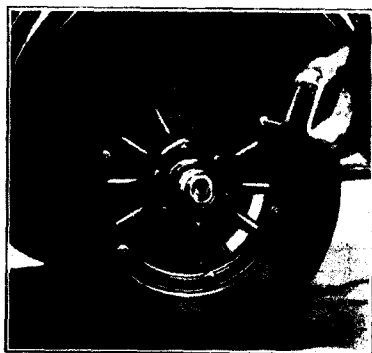


Figure 22a. Jack up the wheel until the tire clears the ground. Remove the dust cap and clamping nut from the valve stem. Remove the six rim clamps, unscrewing them with the brace wrench supplied in the tool kit.

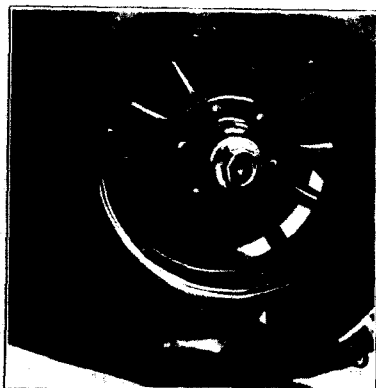


Figure 22b. Rotate the wheel until the valve stem is at the top, and pull the bottom of the rim away from the wheel.

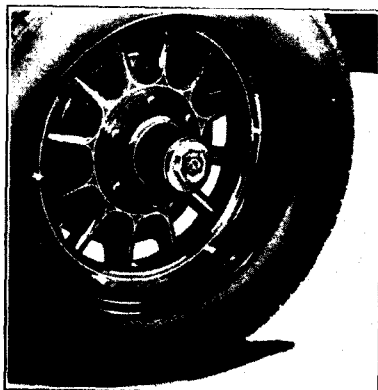


Figure 22c. Then rotate the wheel until the valve stem approaches the bottom, when the rim and tire will roll free from the wheel and can be removed without lifting.

To mount a rim, rotate the wheel until the hole for the valve stem is in the position shown in the last illustration. Insert the valve stem and rotate the wheel, which will carry the rim with it, until the valve stem is at the top. Then push the lower part of the rim into place. Install the rim clamps over the rim and turn the nuts partly down. Go over the nuts again and tighten them firmly. Install the valve stem clamping nut and the dust cap. Be sure the clamping nut is tight.



Figure 23a. Jack up the wheel until the weight of the car is off it, but with the tire still dragging. Place the hub cap wrench on the cap with the cam lever lowered, engage the sliding barrel puller in the slots and turn the puller one-quarter turn either way.



Figure 23b. Raise the lever up and over, thus drawing out the sliding barrel of the hub cap. If the barrel does not withdraw easily, tap the end of the wrench back and forth. This will release the pressure on the teeth of the sliding barrel and allow it to disengage.

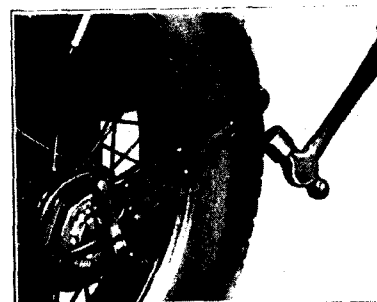


Figure 23c. Loosen the hub cap by striking the wrench a few times with a hammer. (The hub caps are marked with arrows showing the direction in which they screw on and off.) Then jack up the wheel, unscrew the hub cap and pull the wheel off the inner hub. Never attempt to remove the hub cap with the weight of the car on the wheel.

In installing the wheel, see that it is set up snugly on the corrugations on the inner hub. Hub caps are marked either "Right Side" or "Left Side," and must always be installed on the proper side. Start the cap by hand, taking care not to cross the threads. Then apply the hub cap wrench and disengage the sliding barrel as directed above. Securely tighten the cap, striking the end of the wrench with a hammer a few times. Lift up the cam lever. If the sliding barrel does not automatically engage, tighten the cap farther.

Figure 23. Changing Wire Wheels.

NOTE: The nuts on the right-hand wheels are marked R; those on the left are marked L. All nuts screw off in the direction the wheels rotate when the car is going backward, and on in the forward direction.

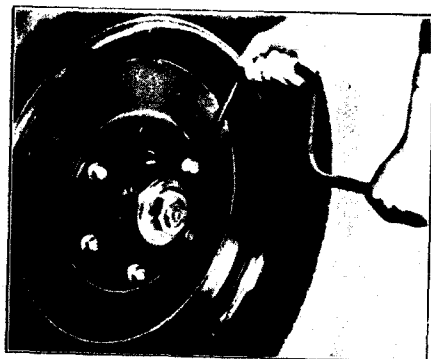


Figure 24a. To remove a front wheel, jack it up until the weight of the car is off it, but with the tire still touching. Then loosen the cap nuts around the wheel hub with the brace wrench in the tool kit. Jack the wheel up further, unscrew the nuts and remove the wheel. In removing a rear wheel, set the hand brake and jack the wheel all the way up.

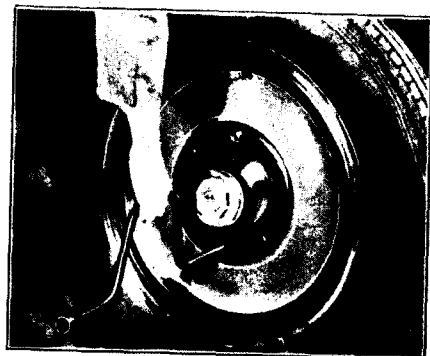


Figure 24b. In mounting disc wheels, use the rear end of the brace wrench as a pilot bar.

To mount a front wheel, bring it up close to the hub and pass the pilot bar through a lower hole and over a lower stud. Lift with the bar, and guide the wheel with the other hand. The weight of the wheel will keep the hub from turning, and the wheel will slip easily into place.

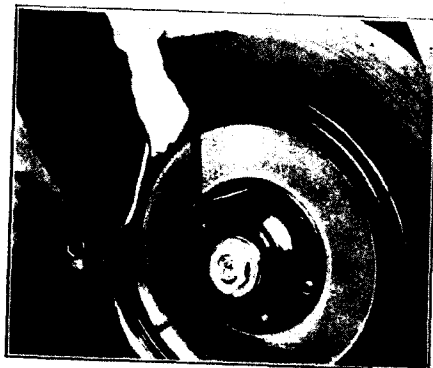


Figure 24c. To mount a rear wheel, set the hand brake and put the pilot bar through an upper hole and over an upper stud.

In either case, several nuts should be started by hand before the pilot bar is removed. The nuts should not be tightened in rotation. After tightening one nut, tighten the nut directly opposite. In this way the first two nuts center the wheel and insure a good fit. The nuts need not be as tight as they can be forced. They should be only moderately tight.

Figure 24. Changing Disc Wheels.

CHAPTER IV

Lubrication

Lubrication Schedule

SYSTEMATIC lubrication, at regular mileage intervals, is the only kind that is effective. On page 40 is a complete lubrication schedule, which, if faithfully followed, will insure correct lubrication for each wearing surface of the Cadillac car.

The unit of the schedule is 4000 miles, which is divided into four 1000-mile intervals. Corresponding to these is a series of four consecutive groups of lubricating operations. When the car has traveled 1000 miles, the points enumerated under Lubrication No. 1 should receive attention. At 2000 miles, Lubrication No. 2 is due, and so on until at 4000 miles, Lubrication No. 4 should be performed. At 5000 miles, the schedule begins again with Lubrication No. 1.

Lubrication Notice

In order that the driver may be continually reminded of the mileage at which the next lubrication is due, the speedometer is provided with a lubrication notice. This consists of a strip of black celluloid (Fig. 25), which is placed across the speedometer cover glass below the total mileage dial and which has two white spaces, one for the lubrication number and one for the mileage at which it is due.

Whenever the car is lubricated on the schedule, the figures then on the celluloid should be erased and the next lubrication number and the mileage at which it is due should be written or stamped in their places. If this notice is used, the driver need only glance occasionally at the speedometer and compare the mileage on the dial with the figures on the notice in order to plan for the necessary attention.

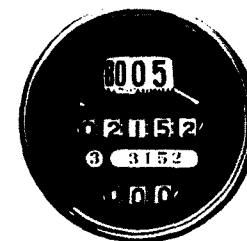


Figure 25. The lubrication notice is a continual reminder of when the next lubrication is due.



CADILLAC LUBRICATION SCHEDULE



OWNER'S NAME _____

ADDRESS _____

ENGINE NO. _____

DATE DELIVERED _____

Do not wait for schedule lubrications before adding engine oil. The oil level should be checked every 100 to 150 miles and oil added if the indicator ball is below "Full." This is especially important on cars driven at high speed.

LUBRICANT	LUBRICATION NO. AND MILEAGE AT WHICH DUE															
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
	1000	2000	3000	4000	1000	2000	3000	4000	1000	2000	3000	4000	1000	2000	3000	4000

LUBRICATION NO. 4	LUBRICATION NO. 2	LUBRICATION NOS. 1 AND 3	CHECK RADIATOR LEVEL	WATER OR ANTI-FREEZE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			ADD ENGINE OIL AS NECESSARY	ENGINE OIL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			GENERATOR AND DISTRIBUTOR OIL CUPS	ENGINE OIL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			FAN—ADD ENGINE OIL	ENGINE OIL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			OIL CAN LUBRICATION	ENGINE OIL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			DOOR HARDWARE	ENGINE OIL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			GREASE GUN CONNECTIONS	CHASSIS LUBRICANT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			WATER PUMP GREASE CUP	WHEEL BEARING GREASE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			*ADD WATER TO STORAGE BATTERY	DISTILLED WATER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			CHECK TIRE INFLATION		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			DRAIN AND REPLACE ENGINE OIL	ENGINE OIL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			CLUTCH THRUST BEARING	FIBER GREASE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			TRANSMISSION—ADD LUBRICANT	CHASSIS LUBRICANT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			REAR AXLE—ADD LUBRICANT	CHASSIS LUBRICANT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			STEERING GEAR—ADD LUBRICANT	CHASSIS LUBRICANT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			WHEEL BEARINGS	WHEEL BEARING GREASE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			SPEEDOMETER DRIVE SHAFT	WHEEL BEARING GREASE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			FLUSH COOLING SYSTEM		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			REFILL SHOCK ABSORBERS	SPECIAL OIL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			REPLACE OIL FILTER CARTRIDGE		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

THE FOLLOWING OPERATIONS CANNOT BE PLACED ON A MILEAGE BASIS AND ARE NOT INCLUDED IN THE ABOVE SCHEDULE:
 REMOVE OIL PAN AND CLEAN PAN AND SCREEN—ONCE A YEAR OR WHENEVER OIL FILTER IS CHANGED
 THIN REAR AXLE AND TRANSMISSION LUBRICANT AS REQUIRED FOR LOW TEMPERATURES.
 DRAIN AND REPLACE REAR AXLE AND TRANSMISSION LUBRICANT—AT BEGINNING OF MILD WEATHER IN SPRING
 REMOVE SPRING COVERS ONCE A SEASON AND REPACK WITH PETROLEUM JELLY.
 *IN SUMMER, INSPECT BATTERY EVERY 500 MILES OR AT LEAST EVERY 2 WEEKS.

RECORD ON OTHER SIDE

LUBRICATION

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Cadillac distributors and dealers are prepared to sell lubrication based on this schedule. A car that is being lubricated on the schedule can be taken to any authorized Cadillac-LaSalle service station, and without further ordering than to specify "Schedule Lubrication," the car will receive the necessary attention.

Lubrication Chart

The lubrication chart which accompanies this manual gives complete detailed instructions for lubricating the car. All of the points which require lubrication are designated on this chart, together with the kind of lubricant to be used, the method of applying it and the frequency with which it should be applied.

The operations are grouped on the chart in the same manner as on the schedule shown in Fig. 26. If the car is lubricated at an "Authorized Station," this schedule will be followed; if not, whoever does the lubrication should follow the schedule and chart exactly.

Lubricants

The selection of proper lubricants should be one of the first concerns of the owner in his attention to the lubrication of the car. The lubricants must not only be of high quality, but their viscosity and other characteristics must be suited to the car.

The owner is urged to consult the distributor or dealer from whom he purchased his car in regard to the names of lubricants which have been tested and approved for use in the Cadillac car.

Engine Oil

It is particularly important that only approved engine oils be used for high-speed, continuous driving. Other oils cannot be depended upon to give satisfactory lubrication and economical mileage under such conditions. If, in an emergency, an unapproved oil must be used, special care must be taken to watch the oil level and add oil as soon as the level drops to "Fill."

During winter, it may be necessary to thin the engine oil with kerosene in order to make the engine crank easily. See page 47 for instructions on lubrication in cold weather.

Figure 26. This is a fac-simile of the Cadillac Lubrication Schedule and Record Card. Provision is made on the back of the card for recording when and where the car is lubricated. A copy of this card can be obtained on request from Cadillac distributors and dealers.

Chassis Lubricant

Lubricant conforming to the specifications for Chassis Lubricant is recommended for the transmission, rear axle, steering gear and all chassis points fitted with grease gun connections.

It is particularly important that only recommended lubricants be used in the transmission. Oil or soap grease will *not* perform satisfactorily.

Lubricants conforming to these specifications may be used without thinning during all weather, except winter weather below temperatures of 20° above zero. Below this temperature, thinning with kerosene is necessary, in order to secure easier gear shifting, easier steering and proper lubrication of gears and bearings.

Wheel Bearing and Cup Grease

Greases approved under the specifications for Wheel Bearing and Cup Grease are suitable for lubricating the wheel bearings and the water pump. This grease is not recommended for chassis lubrication, as Chassis Lubricant is much more effective.

Fiber Grease

Fiber grease approved under the specifications for this type of lubricant is recommended for the clutch release bearing.

Engine Lubrication

The supply of oil is carried in the pressed steel reservoir that covers the bottom of the crankcase. The oil is circulated by a gear pump inside of the crankcase. The pump is driven by a vertical shaft, which is, in turn, driven by a spiral gear on the camshaft. The oil circulated by the pump lubricates the main and connecting rod bearings, the camshaft bearings, the cylinder walls, pistons and piston pins, the front end chains and the valve mechanism.

There are a few points on the engine that are not taken care of in the pressure system. These are the generator and distributor oil cups, the water pump and the fan. Lubricating instructions for these points are given in the lubrication chart. A special explanation of the fan lubrication is given at the end of this chapter.

Oil Level

The normal capacity of the oil pan is two gallons, which fills it to the level of the screen in the pan. When the oil pan contains this amount, the

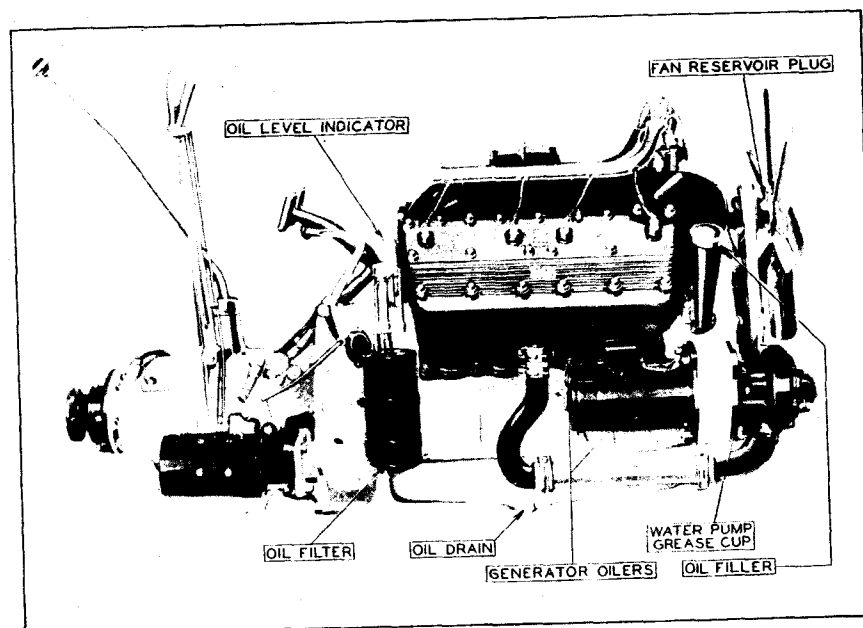


Figure 27. Showing the location of the oil filter, oil level indicator, oil pan drain plug and other lubrication features.

oil level indicator on the right-hand side of the engine (Fig. 27) indicates "Full." As the oil level descends, the indicator indicates "Fill" and then "MT" (Empty). Oil should be added as soon as the indicator ball has dropped to "Fill." If the indicator indicates "MT," under no circumstances should the engine be run until oil has been added.

The mileage interval at which oil must be added depends upon individual circumstances. It is recommended that the oil level indicator be checked every one hundred to one hundred and fifty miles, although it is improbable that oil will be required as frequently as this.

Crankcase Ventilating System and Oil Filter

Cadillac engines are equipped with a crankcase ventilating system, which prevents contaminating of the lubricating oil from seepage vapors; and an oil filter, which removes any dirt or solid matter from the oil.

The crankcase ventilating system is entirely automatic and functions throughout the life of the car without requiring any attention from the

owner. The oil filter, however, gradually becomes filled with the solid matter taken from the oil until it becomes so clogged that it ceases to function. For this reason, it is necessary to replace the filter cartridge every 12,000 miles.

It is important that the filter cartridge be replaced just as soon as the 12,000 miles are up. Otherwise the whole purpose of the oil filter is defeated, and wear of the engine parts will result from the dirty oil. Filter cartridges for replacement can be obtained from Cadillac distributors and dealers or from United Motors Service stations.

Replacing Engine Oil

Although the crankcase ventilating system and the oil filter described in the preceding section greatly prolong the useful life of the oil, it is recommended that the oil be drained and replaced with fresh oil every 2000 miles.

To drain the oil, simply remove the drain plug (Fig. 27). Be sure to reinstall the drain plug before adding the fresh oil. Two gallons of fresh oil should be added, or enough to bring the oil level indicator ball to "Full."

At the end of the first 1000 miles, it is recommended that the car be taken to a Cadillac service station to have the oil pan and screen removed and cleaned with gasoline or kerosene. This should be repeated each time that the filter unit is replaced.

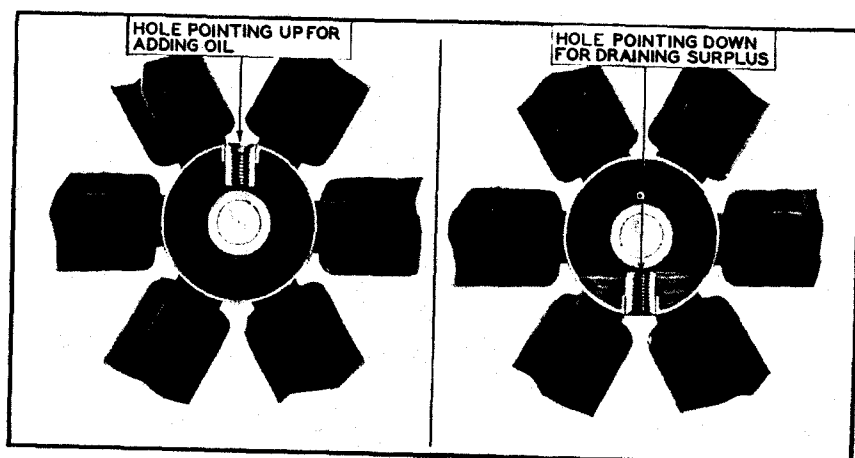


Figure 28. Oil for lubricating the fan is carried in the fan hub. The supply must be replenished every 1000 miles. Grease or heavy oil must never be used in the fan.

Fan

The fan is lubricated by oil contained in a reservoir in the fan hub. The screw plug in the outside of the reservoir should be removed every 1000 miles, and engine oil should be added to bring the oil to the proper level. In adding oil, it is necessary to add somewhat more than enough and then drain off the surplus by turning the fan so that the hole points down. A short stand-pipe inside the reservoir insures that the proper amount of oil is retained.

If no oil runs from the hole when it is first turned down, do not assume that the oil level is correct. Sometimes the reservoir is "air-bound," and the hole should be left pointing down for at least half a minute to give the air a chance to work in. A cloth or piece of waste may be held under the hole to catch the oil.

CHAPTER V

Cold Weather Operation

THE Cadillac is an all-season car, and no owner need hesitate to make full use of his car in severe winter weather, as well as at other times. Satisfactory operation in freezing weather, however, depends upon having the car prepared for cold weather and in giving it the special attention which is required at that time. In this chapter has been grouped all the information relating to care and operation of the car during cold weather. It should be reviewed just prior to the beginning of the winter season.

Preparing for Cold Weather

Anti-Freezing Solutions

In freezing weather, the water in the cooling system must be replaced with some solution that has a lower freezing temperature than that of water. A solution of denatured alcohol and water is recommended.

Before putting anti-freeze in the radiator, the cooling system should be thoroughly cleaned by flushing (see page 52). It is also important to inspect the hose connections and see that they are all in good condition, so that loss of anti-freeze by leakage will be avoided.

The strength of an alcohol solution must be periodically tested with a hydrometer. Alcohol vaporizes more rapidly than water, and the loss by evaporation must be replaced at frequent intervals or the weakened solution will afford little protection against freezing. Care must also be taken not to let an alcohol solution get on the finish of the hood or radiator.

The following table gives the freezing temperature and specific gravity of solutions of denatured alcohol and water:

Lowest Temperature Expected	Per cent by Volume	Specific Gravity (at 60° F.)	Qts. Alcohol required to make 6 gals. solution
10° F.	30	.9668	6 $\frac{1}{4}$
0° F.	38	.9567	8
-10° F.	45	.9475	9 $\frac{1}{2}$
-20° F.	51	.9350	10 $\frac{3}{4}$
-30° F.	57	.9260	12

Patented substitutes should not be used unless tested and approved. Cadillac distributors and dealers should be consulted as to the suitability of an anti-freeze or inquiry may be made to the factory Service Department. Solutions containing calcium chloride or other ingredients injurious to the metal parts of the cooling system must never be used.

Capacity of Cooling System

The capacity of the cooling system is six gallons when filled to the proper level. It is not necessary to add liquid to the radiator whenever the level falls below the filler. There is sufficient liquid in the cooling system if the upper tank is half-full, and any liquid in excess of this is usually forced out through the overflow pipe as soon as the engine becomes warm. When water is used, any loss from this cause is of little consequence, but in winter, to conserve anti-freeze, it is important to avoid adding more liquid than is necessary.

Effect of Alcohol on Finish

Strong solutions of alcohol have a harmful effect on the finish. In adding pure alcohol or strong solutions of alcohol, extreme care must be used not to let the liquid spatter or spill. A funnel and a pouring vessel with a suitable spout are necessary. Especially avoid pouring cold alcohol into a very hot radiator. The effect of this is to make the mixture foam up and possibly bubble over on the finish.

Winter Lubrication

Lubrication of the car requires special attention in winter, not only to insure proper lubrication of the moving parts, but to secure the same ease of operation in starting, steering and shifting gears as during warm weather.

Contrary to popular impression, this does not mean the use of special winter lubricants. The lubricants approved by Cadillac engineers and sold by Cadillac distributors are year-round lubricants. It is not necessary, therefore, to change the engine oil or the lubricant in the transmission or rear axle when cold weather approaches. It is merely necessary to thin these lubricants with kerosene. Authorized Cadillac service stations are prepared with full information as to the amount to be added and the conditions under which it is to be added.

The temperature at which thinning of the engine oil is necessary depends upon the oil used, but with most of the approved oils, some kerosene should

be added as soon as the temperature drops to freezing. From one to three quarts of kerosene are necessary, one quart being plenty for temperatures around freezing, while three quarts will be required at 10° below zero.

After the oil is once thinned, additional kerosene does not ordinarily need to be added until the engine oil is changed at the usual 2000-mile interval. The fresh oil must then be thinned. However, on a long, hard drive, some of the kerosene will be driven out by evaporation. After such a drive, kerosene should be added to replace that which has evaporated.

When thinning the oil in the engine, a small amount of kerosene should also be added to the oil in the fan reservoir.

The lubricant in the transmission, rear axle and steering gear should also be thinned as soon as the weather is so cold that the transmission gears are hard to shift. If a sufficient amount of kerosene is added to provide for the lowest winter temperature expected, it will not be necessary to add kerosene again thereafter during the winter. If ten per cent kerosene is added, this will take care of temperatures down to ten below zero.

Storage Battery

The electrical system of an automobile has much more to do in winter than in summer. The engine is harder to crank and must usually be cranked longer before it starts. The lights are also used to a much greater extent than during the long days of summer. All this means that the battery must be ready for increased demands.

It is therefore a good plan in preparing for the winter season to see that the battery is well charged to begin with, that the battery connections are clean and tight, and that the charging rate of the generator is sufficient.

Gasoline System

The carburetor on the Cadillac engine has automatic compensation for temperature. Nevertheless it is a good plan to have the carburetor adjustment checked when cold weather arrives. This inspection should give special attention to the carburetor choke control to make sure that the enriching device at the carburetor is fully effective when the choke button is operated.

In warm weather, a small amount of water in the gasoline has little or no effect on the running of the engine. In freezing weather, however, even a small amount of water may freeze and stop the entire flow of fuel to the

carburetor. One of the things to be done in preparing for winter weather, therefore, is to clean the gasoline filter and the sediment chambers in the gasoline system.

Starting the Engine

Carburetor Enriching Button

The first difference between starting the engine in cold weather and starting the engine in warm weather is in the greater use of the carburetor enriching device necessary in cold weather. Gasoline does not vaporize as readily at low temperatures, and in order to supply the cylinders with a gaseous mixture rich enough to be ignited, the proportion of liquid gasoline to air must be increased.

At the same time, it is important not to apply the enriching device more than is necessary. The unvaporized gasoline collects on the cylinder walls and works down past the pistons, washing off the lubricant as it goes. Although dilution of the oil supply with this unburned gasoline is minimized by the crankcase ventilating system, it is best to avoid an excess of liquid gasoline in the combustion chambers by careful and judicious use of the enriching device.

The following rule should govern the use of the enriching button in winter weather: Pull the enriching button back just as far as it is necessary to start the engine, but as soon as the engine starts, let the button return as far as possible without causing the engine to stop or slow down. Then release the button entirely as soon as the engine is warm enough to permit doing so.

Priming the Carburetor

In extremely cold weather, if the engine does not start after cranking for a few seconds with the enriching device fully applied, release the starter pedal. Then prime the carburetor by opening and closing the throttle once or twice rather rapidly with the accelerator. Opening and closing the throttle operates a throttle pump on the carburetor and raises the level of the gasoline in the carburetor bowl. The carburetor should never be primed in warm weather and should not be primed unnecessarily in cold weather. Excessive priming is likely to make starting difficult rather than easy.

Position of Throttle Hand Lever

The correct position of the throttle hand lever for starting in cold weather is the same as for starting under other conditions, that is, about one-fourth the way down from the idling position. In warm weather, however, the lever may be returned to the idling position almost as soon as the engine is started. In cold weather, the throttle must be left slightly open until the engine becomes warm.

Position of Spark Control Lever

It is the practice of some drivers to move the spark control lever all the way to "retard," whenever starting the engine. This is the correct position if the engine is to be cranked by hand, but if the engine is to be cranked with the starter, there is no reason for retarding the spark, and in extremely cold weather "popping back" in the carburetor is less likely to occur if the spark is advanced.

Use of Starter

In extremely cold weather, when the car has been standing long enough to become thoroughly chilled, it is a good plan to disengage the clutch during the cranking operation. If this is not done, the starter is called upon to turn the jackshaft gears in the transmission in addition to cranking the engine. At ordinary temperatures, the additional energy required is negligible, but in extremely cold weather, the lubricant in the transmission offers sufficient resistance to rotation of the transmission gears to increase considerably the demand upon the battery and to retard the cranking speed.

Use of Accelerator Before Engine Is Warm

In cold weather, after the engine has been started and before it has run long enough to become warm, the engine cannot deliver its normal power, and it should not be called upon to do so. In accelerating the engine to start the car and in accelerating the car after the transmission is in gear, do not open the throttle suddenly or too far. To do so is not only to invite "popping back" in the carburetor, but to increase the amount of excess unvaporized gasoline in the combustion chambers, both of which results are undesirable. For this reason, also, starting in intermediate should never be attempted when the engine is cold.

CHAPTER VI

General Care

No attempt has been made to include in this manual directions for making adjustments or repairs to the car. Most Cadillac owners prefer to depend for such work on authorized Cadillac-La Salle service stations, as these stations can invariably perform the work more conveniently and economically.

Every owner should, however, know how to perform the few simple operations of general care described in this chapter. These operations are not difficult enough to necessitate a visit to the service station, although this work can also be done in the service station, if desired.

Storage Battery

The storage battery is carried in a compartment between the right-hand running board and the frame. The door of the compartment operates the same as the door of the tool compartment, described on page 30.

The battery is filled with an acid solution from which the water slowly evaporates, and fresh distilled water must be added to each of the three cells at regular intervals to bring the level up to the bottom of the filling tubes. Distilled water should be added at least every 1000 miles, and in warm weather, every 500 miles, or at least every two weeks. If distilled water is not available, melted artificial ice or rain water caught in an earthenware receptacle may be used. Hydrant water or water that has been in contact with metallic surfaces will cause trouble if used. Acid must never be added to the battery.

After adding water to the storage battery in freezing weather, the car should immediately be run far enough to mix the water and acid solution thoroughly. If the car is parked immediately after adding water, the water is likely to stay on top of the acid solution and may freeze, causing extensive damage.

As the storage battery is charged and discharged, the solution reacts chemically with the plates of the battery, the specific gravity of the solution changing as the reaction proceeds. The state of charge of the battery

is thus indicated by the specific gravity of the solution. As the battery is charged, the specific gravity of the solution increases, reaching 1.270 to 1.285 when the battery is fully charged. The specific gravity of the solution decreases as the battery is discharged. A fully discharged battery has a specific gravity of 1.150 to 1.165.

A hydrometer is the instrument used to measure the specific gravity of a solution. A hydrometer syringe is a hydrometer especially designed for convenience in testing the specific gravity of the acid solution in the storage battery. A hydrometer syringe can be obtained at any battery service station. Be sure and get a reliable instrument, for cheap ones may be in error as much as 25 or 30 points.

The specific gravity of the acid solution should never be tested immediately after adding distilled water. If the solution is below the plates, so that it cannot be reached with the syringe, add the necessary amount of water, then drive the car for a few hours before taking the hydrometer reading.

Cooling System

The cooling system should be kept filled with 6 gallons of water, except in freezing weather, when a suitable anti-freezing solution, such as those described on page 46, must be used.

The cooling system should be drained and flushed every 4000 miles. If possible, this should be done at a Cadillac service station, or where there are facilities for reversing the flow of water through the radiator. If this is not possible, use the following method:

Run the engine until the opening of the radiator shutters indicates that the engine is warm. Stop the engine and immediately open the drain valve.

After the liquid has drained off, refill the cooling system with hot water and repeat the operation described above. If, in draining the second time, the water is very dirty, it may be advisable to repeat the flushing operation a third time, placing one or two handfuls of sal-soda in through the radiator filler. The sal-soda must not be permitted to get on the finish of the hood or radiator. If sal-soda is used, the cooling system must be drained and flushed again before refilling for use.

Gasoline Filter

A gasoline filter (Fig. 29) is provided in the gasoline line between the vacuum tank and the carburetor. This filter has a glass bowl through

which the accumulation of water and sediment can be easily seen. The bowl should be removed and the gauze screen should be cleaned, as soon as any accumulation appears in the bowl. This can be done as follows:

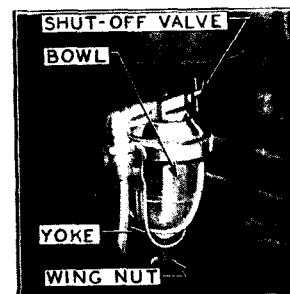


Figure 29. To remove the filter bowl for cleaning the screen, close the shut-off valve, loosen the wing nut at the bottom and disengage the supporting yoke.

First shut off the gasoline by turning clockwise the small T-handle valve at the side of the filter. Then unscrew the thumb screw under the bowl, after which the yoke supporting the bowl can be swung to one side and the bowl can be removed. If the screen does not come off with the bowl, it can be removed by pulling it straight down.

In putting back the bowl, make sure that it seats properly against the cork gasket in the top of the filter before tightening the thumb screw. Do not forget to turn the gasoline on by turning the valve counter-clockwise as far as it will go.

There is also a strainer in the vacuum tank at the point where the gasoline enters the inner chamber. The strainer should be removed and cleaned occasionally. The strainer is accessible after disconnecting the feed pipe and unscrewing the inlet elbow.

Temporary Brake Adjustment

It is recommended that all adjustment of the brakes be done at an authorized Cadillac-La Salle service station. In an emergency, however, the following temporary adjustment can be made by the driver.

Each brake is fitted with an adjusting nut on the cam lever, as shown in Fig. 30. To tighten the brake adjustment turn all four adjusting nuts half a turn clockwise. These adjusting nuts lock each sixth of a turn.

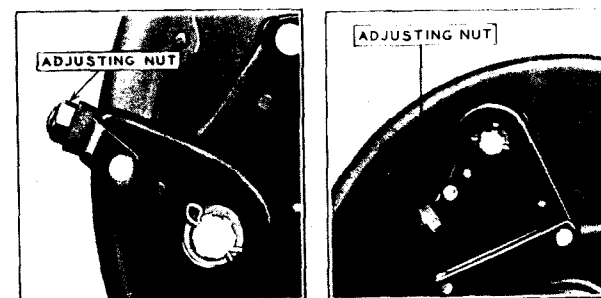


Fig. 30. A temporary brake adjustment can be secured by turning the adjusting nut on each brake clockwise $\frac{1}{2}$ turn. The front brake is at the left, the rear brake at the right.

These adjusting nuts lock each sixth of a turn.

Body

Care of Finish

The Duco finish of Cadillac bodies can be kept new and lustrous with the simplest care. The car should merely be wiped off every few days with a soft dry cloth. An occasional polishing with Duco No. 7 or I-sis or some other recognized Duco polish (but never with furniture polish) will prove beneficial.

If the finish is cared for by being wiped at regular intervals, it will not need to be washed, except when it has accumulated a considerable amount of mud or dust. When washing the car, use plenty of clean cold water. Do not use hot water, and do not wash the hood while it is hot, as this will in time destroy the luster. Do not use soap.

If a hose is used in washing, do not use a nozzle, but let the water flow gently from the hose and flush off the dirt gradually. A soft wool sponge can be used to advantage in removing dirt.

After the washing is completed, squeeze the sponge as dry as possible and pick up all water from crevices. Then thoroughly wet a clean soft chamois, wring it as dry as possible and dry the finish. The finish can then be rubbed with a clean soft cloth to bring out the luster.

Care of the Top

Ordinary dust can be removed from the top with a soft dry cloth. Grease spots, stains and dirt film can be removed by washing with a mild, neutral soap. Rinse thoroughly with clear water to remove all traces of the soap, then dry with a chamois or cloth. Gasoline, naphtha, kerosene and fabric cleaners should not be used for cleaning the top, as such preparations are likely to dull the luster and damage the fabric, causing leaks.

If the top becomes dull or check-marked, clean it thoroughly and apply a coat of Du Pont No. 7 Auto Top Finish. This should be applied with a flat varnish brush and allowed to dry over night. This will restore the luster, protect the top fabric, and keep it thoroughly waterproof. A coat of this finish every six months will keep the top in perfect condition.

Cleaning Upholstery

To keep the upholstery in closed cars in the best condition, it should be cleaned thoroughly at least once a month with a whisk broom and vacuum

cleaner. Dirt and grit accumulating in the fabric wear it out faster than use.

Spots on the upholstery may be cleaned with any good dry cleaner. When the cleaner has thoroughly evaporated, apply a hot flatiron wrapped in a wet cloth. Steaming the fabric and rubbing lightly against the nap will raise the nap to its normal position.

Door Hardware

Many owners who give careful attention to lubrication of the chassis do not give the same attention to the lubrication of door locks and hinges. If the door hardware is to operate properly, it must be lubricated regularly. Directions for this lubrication are included in the lubrication chart, and these directions should be followed as faithfully as the rest of the chart.

CHAPTER VII

Storing Car

IF THE car is not to be used for a period of several months, it should be protected from deterioration during the period when it is not in use by carefully preparing it for storage.

Engine

To prepare the engine for storage, proceed as follows: Run the engine until opening of the radiator shutters indicates that the engine is warm. This may be done by driving on the road or by running the engine idle. In the latter case, care should be taken that there is sufficient ventilation to avoid injury from carbon monoxide poisoning. (See page 21.)

After the engine is warm, place the car where it is to be stored and shut off the flow of gasoline to the carburetor by turning the valve above the filter. As soon as the engine starts to slow down, raise the polished aluminum cap on top of the carburetor and inject three or four tablespoonfuls of clean fresh engine oil into the carburetor. Injection of the oil will stop the engine.

Remove the spark plugs. Inject two or three tablespoonfuls of engine oil into each spark plug hole, and before replacing the plugs, crank the engine three or four revolutions with the ignition switched off. This will tend to distribute the oil over the cylinder walls. The engine should not be started again after injecting the oil. If it is started, it will be necessary to repeat the treatment.

Drain the cooling system.

Storage Battery

If the car is to be stored during the winter, the storage battery should have special treatment in order to protect it against freezing.

Shortly before the car is used for the last time, distilled water should be added to bring the level of the solution up to the bottom of the filling tubes. (See page 51.) After the water added has had an opportunity to mix thoroughly with the acid solution by running the car or engine, the specific gravity should be taken with a hydrometer. If the specific gravity

of the solution is above 1.270, there will be no danger of the acid solution freezing. If, however, the specific gravity is below 1.270, the battery should be removed and charged. Unless the battery is fully charged, or nearly so, it is probable that the acid solution in the battery will freeze and cause extensive damage.

The battery ground connection should in all cases be disconnected during storage, as a slight leak in the wiring will discharge the battery and lower the specific gravity to the point where the solution may freeze.

If possible, the storage battery should be removed and charged from an outside source every two months during the storage period.

Tires

During the storage of the car, it is best to remove the tires from the rims and to keep the casings and tubes in a fairly warm atmosphere away from the light. The tubes should be inflated slightly after the tires have been removed.

If it is not convenient to remove the tires from the car, and the car is stored in a light place, cover the tires to protect them from strong light, which has a deteriorating effect on rubber.

The weight of the car should not be allowed to rest on tires during the storage period. If tires are not removed, the car should be blocked up, so that no weight is borne by the tires. The tires should also be partly deflated.

Body and Top

A cover should be placed over the entire car to protect it from dust. In storing an open car, the top should be up.

Taking Car Out of Storage

In putting into use again a car that has been stored, it is advisable, unless the storage battery has been removed and charged at periodic intervals, to remove the battery from the car and give it a fifty-hour charge at a four-ampere rate. If the battery has received periodic charges, or if the specific gravity is above 1.200, simply add distilled water to the proper level and connect the leads. If there is a greenish deposit on the terminals of the battery, remove this with a solution of bicarbonate of soda (common cooking soda) and water. Do not allow any of this solution to get into the battery.

Before starting the engine, drain the oil from the oil pan and remove and clean the oil pan and screen. After reinstalling the oil pan, add eight quarts of fresh engine oil. Fill the cooling system, being sure to use anti-freezing solution in freezing weather. Remove the spark plugs and inject two or three tablespoonfuls of engine oil into each cylinder. Reinstall the spark plugs and, with the ignition switched off, crank the engine a few seconds with the starter to distribute the oil over the cylinder walls.

Start the engine in the usual manner. As soon as the engine starts, immediately let the carburetor enriching button go as far forward as possible without causing the engine to stop or slow down materially, and then open the throttle until the ammeter reads approximately 10 with all lights switched off. While the engine is running, lift the aluminum cap on top of the carburetor and inject two or three tablespoonfuls of engine oil into the carburetor. It is a good plan to run the car outdoors as soon as this has been done. Release the carburetor enriching button entirely as soon as the engine is warm enough to permit it.

CHAPTER VIII

Specifications and License Data

Type of engine.....	8 cyl. V-type
Diameter of cylinder bore.....	3 $\frac{5}{16}$ in.
Length of stroke.....	4 $\frac{15}{16}$ in.
Piston displacement.....	341
Horsepower (N. A. C. C. rating).....	35.1
Engine number.....	See below
Capacity of gasoline tank.....	21 gals.
Capacity of engine lubricating system.....	2 gals.
Capacity of cooling system.....	6 gals.
Capacity of transmission.....	2 $\frac{1}{2}$ qts.
Capacity of rear axle.....	2 $\frac{1}{2}$ qts.
Wheelbase.....	140 in.
Tires.....	7.00-20
Valve setting, inlet.....	.004 in.
Valve setting, exhaust.....	.006 in.
Spark plug setting.....	.025-.028 in.
Contact point setting.....	.027 in.
Generator charging rate, maximum.....	18-20 amps. cold 8-10 amps. hot
Fan belt slack.....	$\frac{5}{8}$ in.
Front axle toe-in.....	$\frac{1}{8}$ to $\frac{1}{4}$ in.

Engine and Unit Assembly Numbers

Each Cadillac car, when shipped, carries an engine number, which is also a serial number. This is the number to be used in filling out license and insurance applications and in general reference of the car. The engine number is stamped on the car in two places: On the name plate on the front face of the left side of the dash, and on the crankcase just below the water inlet on the right-hand side.

The various units, such as the transmission, steering gear, etc., also carry unit assembly numbers. These are located as described below. It is im-

portant in ordering parts to give, not only the engine number of the car, but also the unit assembly number of the unit to which the part belongs.

Transmission number—on the upper left-hand edge of the flange by which the transmission is bolted to the crankcase.

Steering gear number—on the steering gear housing, just below the grease gun connection.

Carburetor number—on right front face of the flange by which the carburetor is attached to the intake header.

Generator number—on the side of the generator just in front of the cut-out relay.

Starting motor number—on the right-hand side of the starter, just below the switch.

Front axle number—on the upper surface of the axle I-beam at the right-hand end just above the steering stop screw.

Rear axle number—on the rear surface of the axle housing just to the right of the cover plate.

Chassis (frame) number—on the upper surface of the left-hand side bar, just ahead of the steering gear.

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Cadillac Lubrication Chart



Cadillac Motor Car Company

Detroit, Michigan

U. S. A.

Publication No. 341-2

1929

341-B

CADILLAC LUBRICATION CHART

Do not wait for schedule lubrications before adding engine oil. The oil level should be checked every 100 to 150 miles and oil added before the indicator ball drops to "F". This is especially important on cars driven at high speeds.

THIS LUBRICATION CHART is arranged to be used in conjunction with the 1000-mile lubrication schedule explained in the Operator's Manual. Lubrication No. 1 includes the items indicated on the inner line surrounding the chassis. Lubrication No. 2 includes the items on the second line; Number 3 is a repetition of Number 1 on the first line; and Number 4 includes the items on the outside line.

The following items cannot be placed on the regular 1000-mile schedule, so they should be performed at the recommended intervals.

Every day—Check level of liquid in radiator.

Every week—Check tire pressure.

When cold weather starts—Thin engine oil with kerosene to permit easier cranking. Also thin lubricant in rear axle, transmission and steering gear.

At beginning of warm weather—Drain thinned lubricant and replace with fresh lubricant.

Once each season—Remove spring covers and re-pack with petroleum jelly.

Every 12000 miles—Check level of special oil in shock absorbers.

Every 12000 miles—Replace oil filter cartridge. Remove and clean engine oil pan and screen at same time.



Accelerator Rocker Shaft

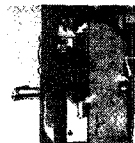
Apply a few drops of engine oil to the points indicated every 1000 miles.



Starter Pedal Rocker Shaft

Apply a few drops of engine oil to the points indicated every 1000 miles.

It is a good plan to apply a few drops of oil to the brake check pins at the same time.



Door Locks and Wedges

Apply a small amount of oil to the door strikers and wedges every 1000 miles.



Door Striker Plates

Apply a small amount of oil to the door striker plates and wedge plates on the body every 1000 miles.



Door Checks

Apply a small amount of cup grease to the pin in the door check at the top of each door every 1000 miles.



Door Hinges

Apply a few drops of oil to the door hinges every 1000 miles.

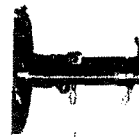
Rear Shackles of Rear Springs

2 each side. Apply chassis lubricant to connections with grease gun every 1000 miles.



Brake Shafts on Axle

3 each side. Apply chassis lubricant to connections with grease gun every 1000 miles.



Brake Shafts Under Cross-Member

1 each side. Apply chassis lubricant to connections with grease gun every 1000 miles.



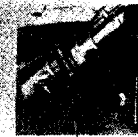
Clutch Release Fork

Apply chassis lubricant to connection with grease gun every 1000 miles.



Steering Gear

Apply chassis lubricant with grease gun every 2000 miles, until it flows from overflow hole. Be sure to replace clip on overflow hole after adding lubricant.



Steering Connecting Rod

Apply chassis lubricant to connection with grease gun every 1000 miles.



Rear Shackles of Front Springs

2 each side. Apply chassis lubricant to connections with grease gun every 1000 miles.



Steering Connections

1 each side. Apply chassis lubricant to connections with grease gun every 1000 miles.



Front Engine Support

Apply chassis lubricant to connection with grease gun every 1000 miles.



Front Spring B

1 each side. Apply chassis lubricant to connection with grease gun every 1000 miles.



NO. 4 AT 4000 MILES

NO. 2 AT 2000 MILES

NO. 1 AT 1000 MILES

NO. 1 AT 1000 MILES

NO. 1 AT 1000 MILES

NO. 1 AT 1000 MILES

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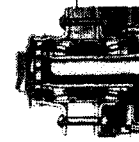
NO. 1 AT 1000 MILES

NO. 1 AT 1000 MILES



Rear Axle

Add chassis lubricant to being level up to filler hole every 2000 miles. See special instructions for add another.



Rear Wheel Bearings

1 each side. Remove bearings, clean and repack with wheel bearing grease and readjust every 4000 miles. This work should be done only by someone thoroughly familiar with wheel bearing adjustment.



Front Shackles of Rear Springs

2 each side. Apply chassis lubricant to connections with grease gun every 1000 miles.



Storage Battery

Add distilled water to being level up to fraction of filling hole. In warm weather check level every 500 miles or every two weeks.



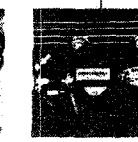
Transmission

Add chassis lubricant to being level up to filler hole every 2000 miles. See special instructions for cold weather.



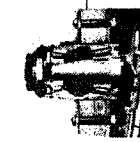
Clutch Release Bearing

Fill grease cup with fiber grease and turn down a few turns every 2000 miles. Lift right side of hood to reach grease cup.



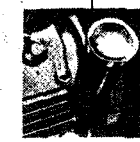
Generator Oil Cups

2 at three. Apply a few drops of engine oil with oil can every 1000 miles.



Front Wheel Bearings

1 each side. Remove bearings, clean, repack with wheel bearing grease and readjust every 4000 miles. This work should be done only by someone thoroughly familiar with wheel bearing adjustment.



Engine Oil Filler

Check oil level every 100 to 150 miles and add oil at necessary. Drain and replace engine oil every 2000 miles.



Water Pump

Two down and refill g. cup with cup grease every 1000 miles.

CAUTION: Never run the engine in a small closed garage. Open the door before starting the engine.

Engine Oil = □

Chassis Lubricant = ○

Fibre Grease = ◇

Wheel Bearing Grease = ○

Distilled Water = △

PRELIMINARY SERVICE INFORMATION

Cadillac 341-B
LaSalle 328

*Service information regarding the principal changes
in construction and improvements in the
new Cadillac and LaSalle Cars*



July, 1928

Service Department
CADILLAC MOTOR CAR COMPANY
DETROIT, MICHIGAN

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Front Axle

The front axles on both the LaSalle 328 and the Cadillac 341-B cars are similar to the previous units.

The following 341-A parts are interchangeable with 341-B parts: the axle I-beam, and the steering cross-rod. Likewise, the same 303 parts are interchangeable with 328 parts.

The steering knuckles are of similar construction, but differ to accommodate the new brakes. The brakes are entirely new, and constitute the main difference in the new axles.

A grease shield and drain is installed below the steering knuckle on the 341-B axle, to prevent any possibility of lubricant from the steering knuckle getting on the brake lining. As the LaSalle steering knuckle bearings are outside of the dust shield, a similar drain is not necessary on the 328.

There is no change in the caster angle, camber, or toe-in, and the service operations, excepting those which apply to the brakes, are the same as for 341-A and 303 cars.

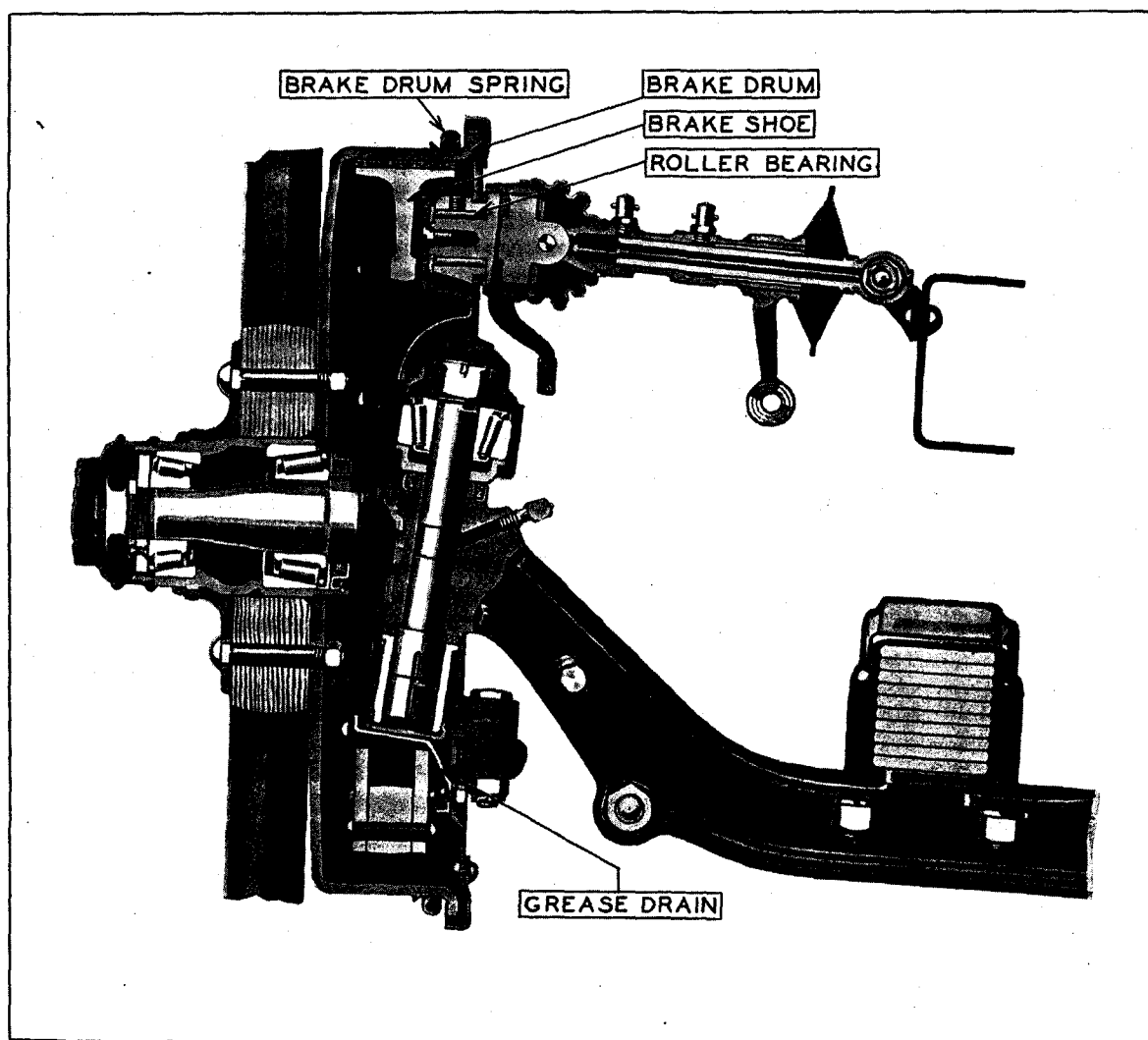


Fig. 1. Sectional view of the Cadillac 341-B left front wheel and steering knuckle.

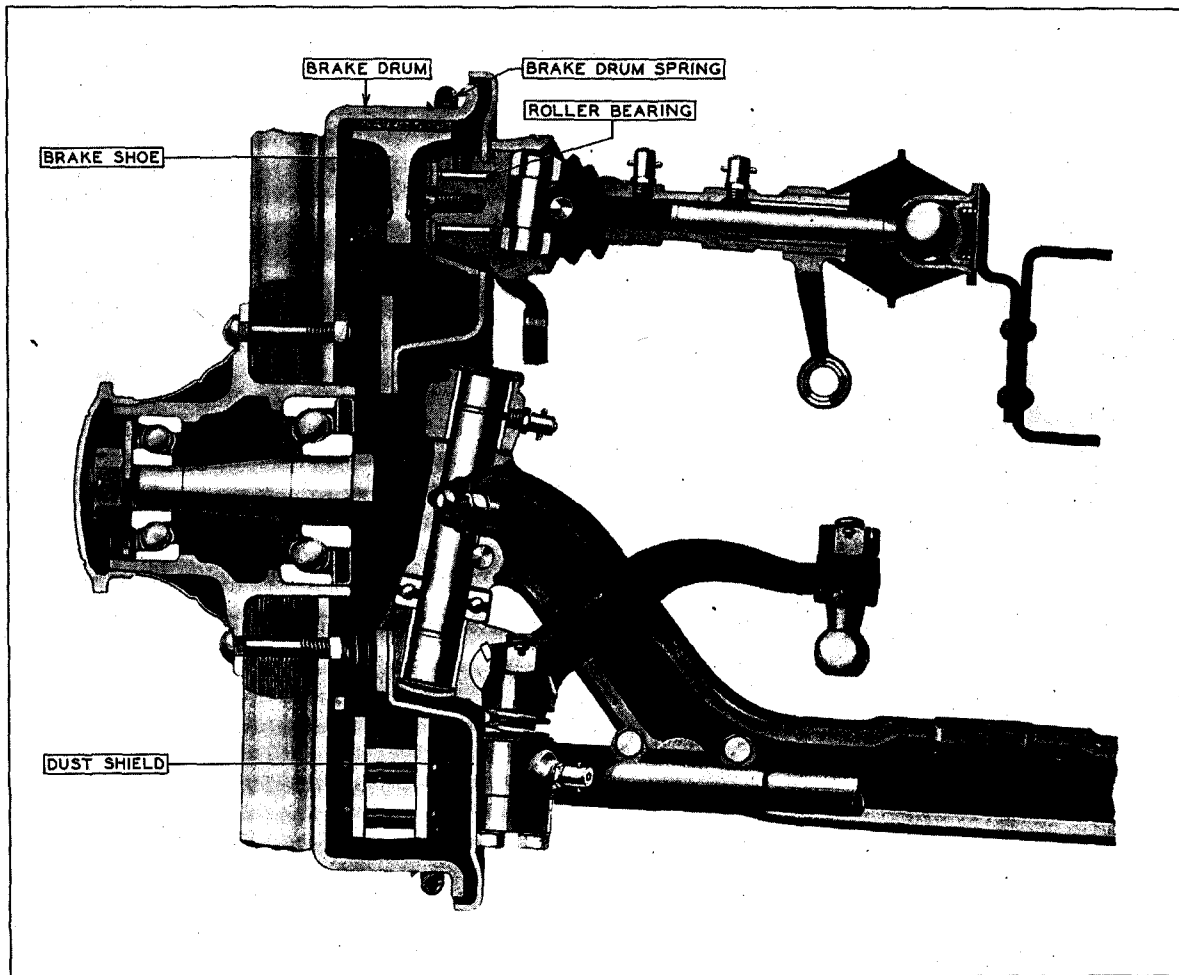


Fig. 2. Sectional view of the LaSalle 328 left front wheel and steering knuckle.

Rear Axle

Cadillac

The 341-B rear axle is similar to the 341-A. The axle housing, however, is not interchangeable, as the dust shields and supports for the new brakes are entirely different. The brackets for the double acting shock absorbers are also different.

The axle-shafts are interchangeable with the 341-A shafts. The differential carrier assembly is also interchangeable.

LaSalle

The three-quarter floating construction is retained on the 328 rear axle. The axle housing, however, has been changed and is now of the one-piece "banjo" type, similar to the 341. With this construction, a truss-rod is no longer

necessary.

To insure completely against lubricant getting on the brake lining, the 328 axle is now equipped with the same type of axle-shaft packing as the 341 axle. This eliminates the necessity for drain passages at the ends of the housing. The wheel bearings receive no lubrication whatever from the axle housing and must be repacked in wheel bearing grease every 4000 miles. The axle-shafts are not interchangeable with the 303 shafts.

The differential carrier mounting is the same and the differential carrier is interchangeable with the 303 carrier.

Service work on both rear axles remains the same as previously, except work having to do with the brakes.

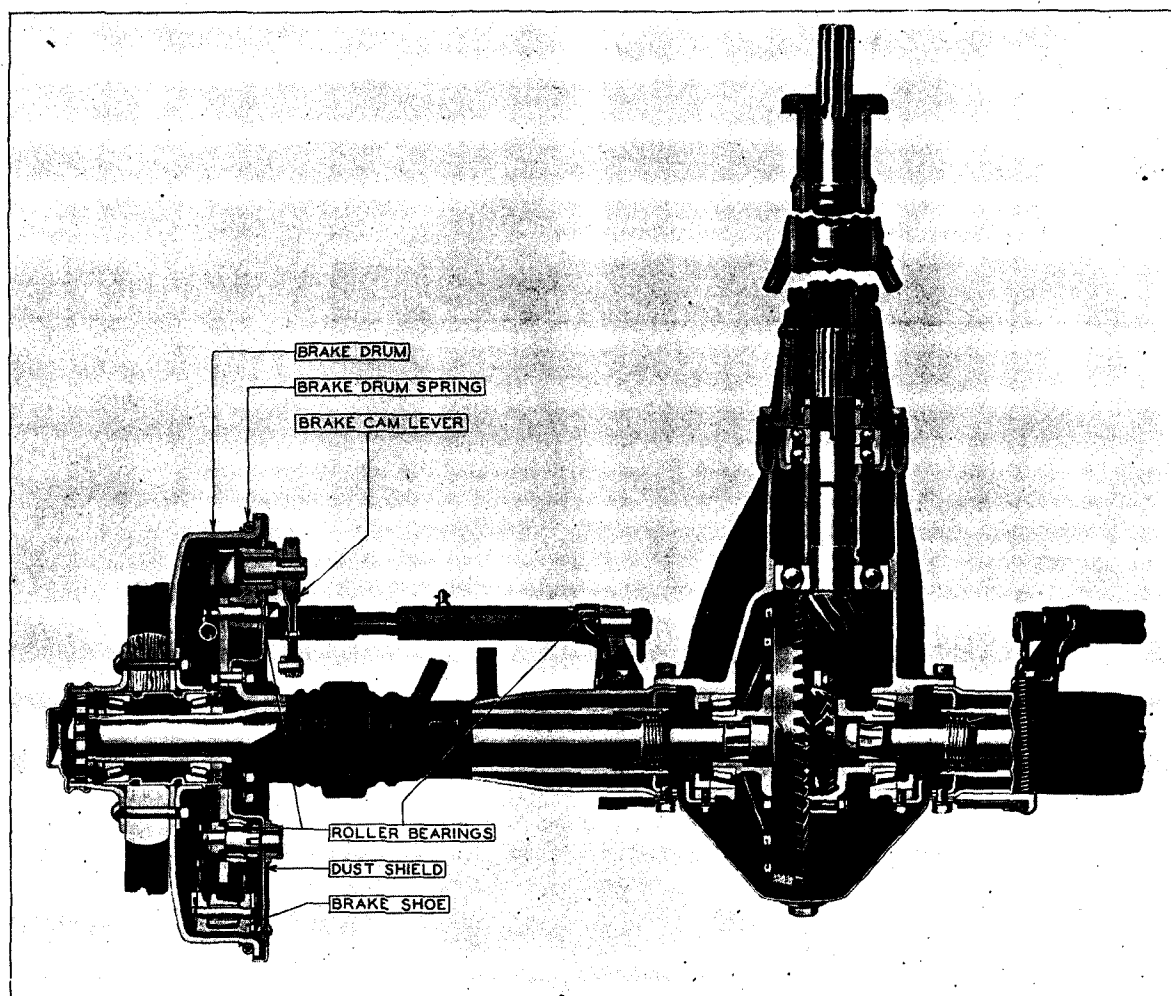


Fig. 3. Sectional view of 341-B rear axle.

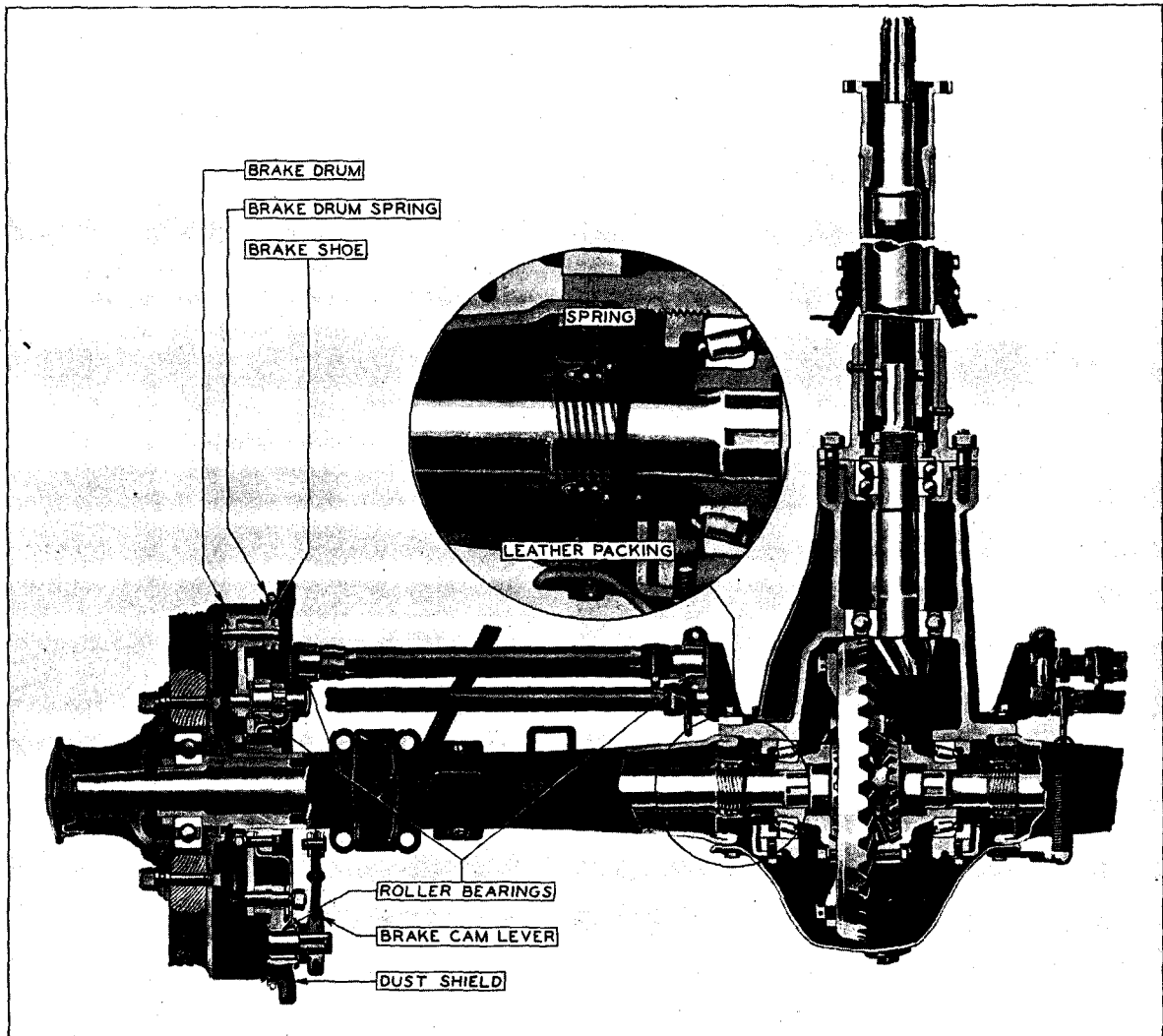


Fig. 4. Sectional view of 328 rear axle, showing insert of new axle shaft packing.

Brakes

The braking system is entirely new. All brakes on the new cars are internal. The brakes on the 341-B and on the 328 are the same, except for the size of the drums and the brake shoes, and except for slight differences in the connections.

The brake drums are $\frac{1}{4}$ " thick and are reinforced by a turned out flange at the inner edge. The braking surface of each drum is ground to size.

A coiled spring surrounds each drum, to give additional cooling surface and to absorb any noise-producing vibrations in the drum. The Cadillac brake drums are $16\frac{1}{2}$ inches in inside diameter, and the LaSalle drums are 15 inches.

Foot Brakes

The brake lining is riveted to rigid shoes of die-cast aluminum alloy, rather than to flexible steel bands. There are two shoes for each foot brake, one long shoe, which is self-energizing for forward motion, and one short shoe which is self-energizing for backward motion.

The shoes are anchored to supporting plates which are bolted to the knuckle in the case of the front brakes, and to a flange on the axle housing in the case of the rear brakes. The

short shoe is anchored directly on the support, while the long shoe is connected to the anchor pin through a pair of links.

The brake shoes are forced against the drums by hardened steel cams, which have three important features to distinguish them from the usual cam-operated brakes:

1. The cam does not work between the ends of the shoes themselves, but rather between links pivoted on the ends of the shoes. These links have rounded ends and give the effect of rolling contact, greatly reducing friction at the cam when the brakes are applied.

2. The cams are self-centralizing to compensate for unequal wear on the lining. This is accomplished by carrying the cam and its bearing in a cam bracket which is pivoted in the dust-shield. An arm of this bracket floats on a spring which is originally adjusted to hold the cam in the central position. Then, if subsequent wear on the lining is not the same on both shoes, the spring permits the cam to re-centralize itself when the brakes are applied. The adjustment of the cam centralizing bracket is one of the two adjustments to which reference will be made later.

3. The lever which operates the cam embodies an entirely new principle, which permits changing the angle of the cam without chang-

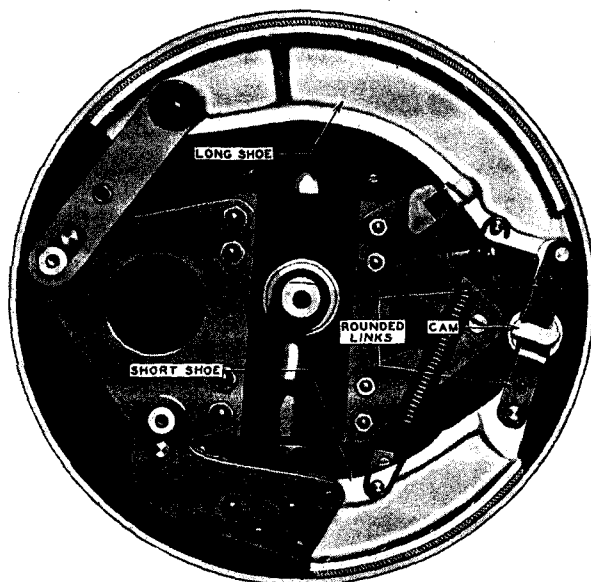


Fig. 5. Cadillac 341-B left front brake.

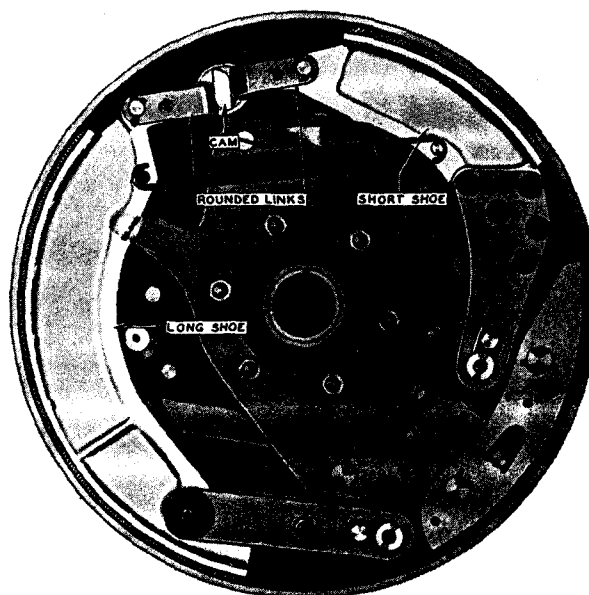


Fig. 6. Cadillac left rear brake showing foot brake shoes.

LaSalle brake construction is practically the same.

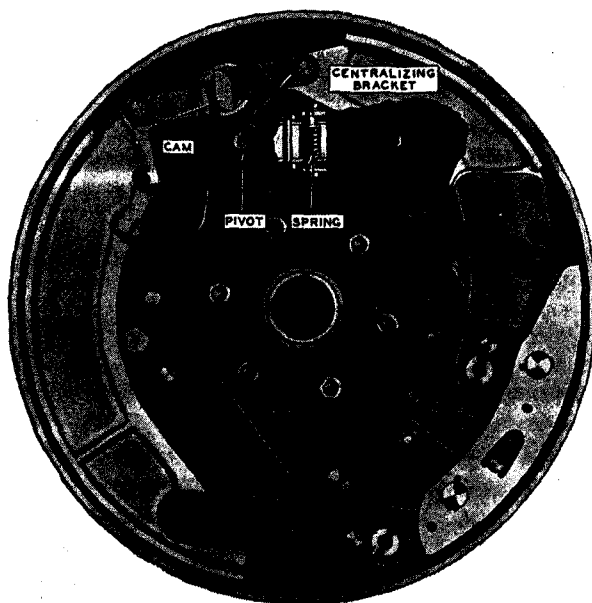


Fig. 7. Cam centralizing mechanism in Cadillac left rear brake.

ing the angle of the lever. This lever consists of a stamped steel casing in two halves, riveted together, containing a hub which is splined to fit the cam shaft; and a short piece of steel cable, one end of which is locked to and partially wound around the hub. The free end of the cable is threaded to receive an adjusting nut on the outside of the casing.

The principle of the cam lever is easily seen on reference to the sectional view. Screwing down the adjusting nut unwinds the cable from the hub, turning the hub and the cam to a new position. The adjustment of the nut on the cam lever is almost as fine as that of microm-

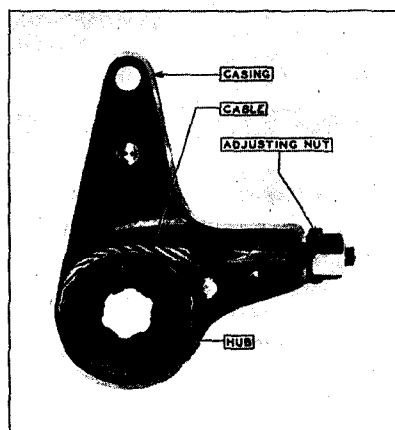


Fig. 8. Cam operating lever with front of casing removed.

eter calipers as one-sixth of a turn of the nut changes the clearance between the lining and the drum by less than .002 of an inch. Owing to the fineness of the adjustment and the permanent curvature of the rigid shoes, it is never necessary to measure the drum clearance directly with feeler gauges.

Temperature Compensation

The new brakes automatically compensate for temperature differences resulting from the heat developed by continuous application. The brake drums, on the surface of which the heat is generated, are made of steel; while the brake shoes, which are insulated from the drum by the lining, are made of aluminum alloy, which has a much greater co-efficient of expansion than steel. The result of this is that, while the drums always get hotter than the shoes, the shoes expand practically the same amount, maintaining the same clearance after the drums become hot as before.

All of the foregoing features apply equally to Cadillac and LaSalle. The front brakes are practically identical on both cars, except for size. The rear brakes, however, differ not only in size, but in location and hook-up of the cam lever. These differences have no effect whatever on the principle of operation or on the adjustment.

Brake Adjustments

There are only two adjustments to be made for each foot brake. Both of these are outside the brake-drums.

The first adjustment is to centralize the cam bracket. To do this, simply loosen the nut (Fig. 9), apply the brakes firmly, and then while holding the pedal down, tighten the nut again. This adjustment fixes the neutral position of the cam bracket so that both shoes will have the same clearance when released. Unless tampered with, this adjustment ordinarily need be made only when the brakes are relined. It is so simple, however, that it is recommended that it be regularly performed whenever the brakes are adjusted.

The second adjustment is the cam lever which has already been described. This is the adjustment to take up wear on the lining. The correct adjustment of the cam lever is determined entirely by equalization and by pedal travel. It is never necessary to measure the clearness between the lining and the drum.

Before adjusting the nuts on the cam levers,

check the brakes for equalization between the right and left front brakes and then between the right and left rear brakes. If the brakes are already properly equalized, simply turn all four nuts down the same number of turns. One and one-sixth turns is equivalent to one inch of pedal travel. The standard adjustment calls for $2\frac{1}{4}$ inches of pedal travel before the brakes take hold. This is equivalent to .007-.008 inch clearance between linings and drums. The nuts look every one-sixth of a turn. A special box-wrench (tool 109229) is supplied to facilitate this adjustment.

If the brakes are not properly equalized, first turn each nut down until the corresponding wheel just begins to drag, then back off all four nuts the same number of turns (approximately two turns) until the pedal has the correct amount of free travel. Check the result and make any necessary correction to insure proper equalization.

Brake Connections

The hook-up of the foot brakes is similar in principle to the 341-A. A new feature is the use of stops attached to the center cross member, which permanently locate the levers on the cross shafts in their correct positions so that the correct adjustment cannot be tampered with.

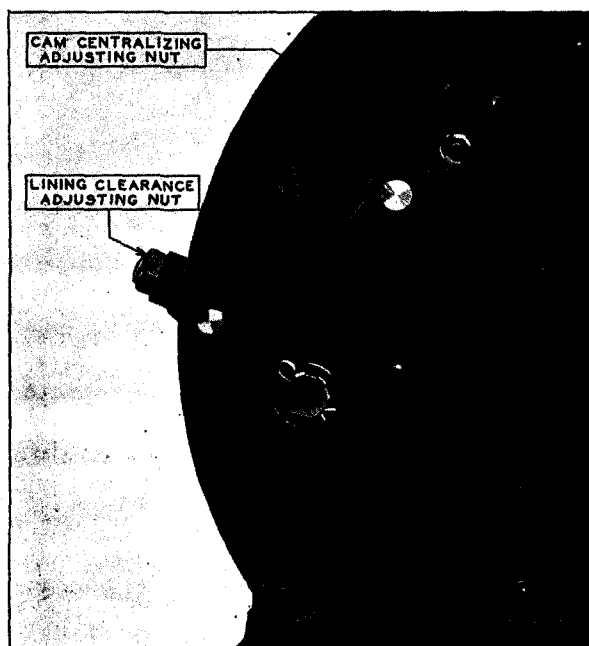


Fig. 9. Front brake dust shield, showing adjustments. The adjusting nuts are located similarly on the rear brakes.

Another important improvement is the use of roller bearings for all foot brake rocker shafts. They make the brakes easier to operate and insure complete release.

Neither the front or rear foot brakes require a mechanical equalizer. Both right and left hand levers are fastened to the cross-shaft. Because of the fineness of the cam lever adjustment, the brakes can be equalized better by adjustment than by a mechanical equalizer.

Adjustment of Foot Brake Connections

Because of the use of the permanent stops, there are only three adjustments to be made in the brake connections, the pedal rod, the rear brake rods, and the front brake cables. All of these adjustments are correctly set at the factory and should not be changed unless they have been tampered with.

The adjustment of the pedal rod determines the position of the pedal arm which should have $\frac{3}{8}$ " clearance under the toe board. Unlike previous cars, there is no pedal stop screw.

The adjustment of the yokes on the rear brake rods determines the released position of the rear brake cam levers. The correct position of the levers is shown in Fig. 10.

The adjustment of the front brake cables determines the released position of the front brake cam levers. The correct position of these levers is also shown in Fig. 10. The adjustment of the front brake cables can be made at either end.

Never adjust the cables to take up wear on the lining; wear is taken up by the cam lever adjustment. If any change is made in the adjustment of the rods or cables, readjust the nuts on the cam levers afterward.

Hand Brakes

The hand brakes consist of a separate brake shoe inside of each rear drum, operated through a linkage independent of the foot brake linkage. The hand brake shoe occupies the space between the two foot brake shoes, there thus being three shoes inside of each rear brake drum.

The shoe floats between two anchors or stops, one for forward motion and one for backward motion. The shoe is applied through a link operated by an eccentric pin, which is in turn connected by linkage to the rocker-shaft.

The hand brakes do not require any adjustment, except when they are re-lined. An adjustment is provided to align the shoe then so that it is parallel to the brake drum. This

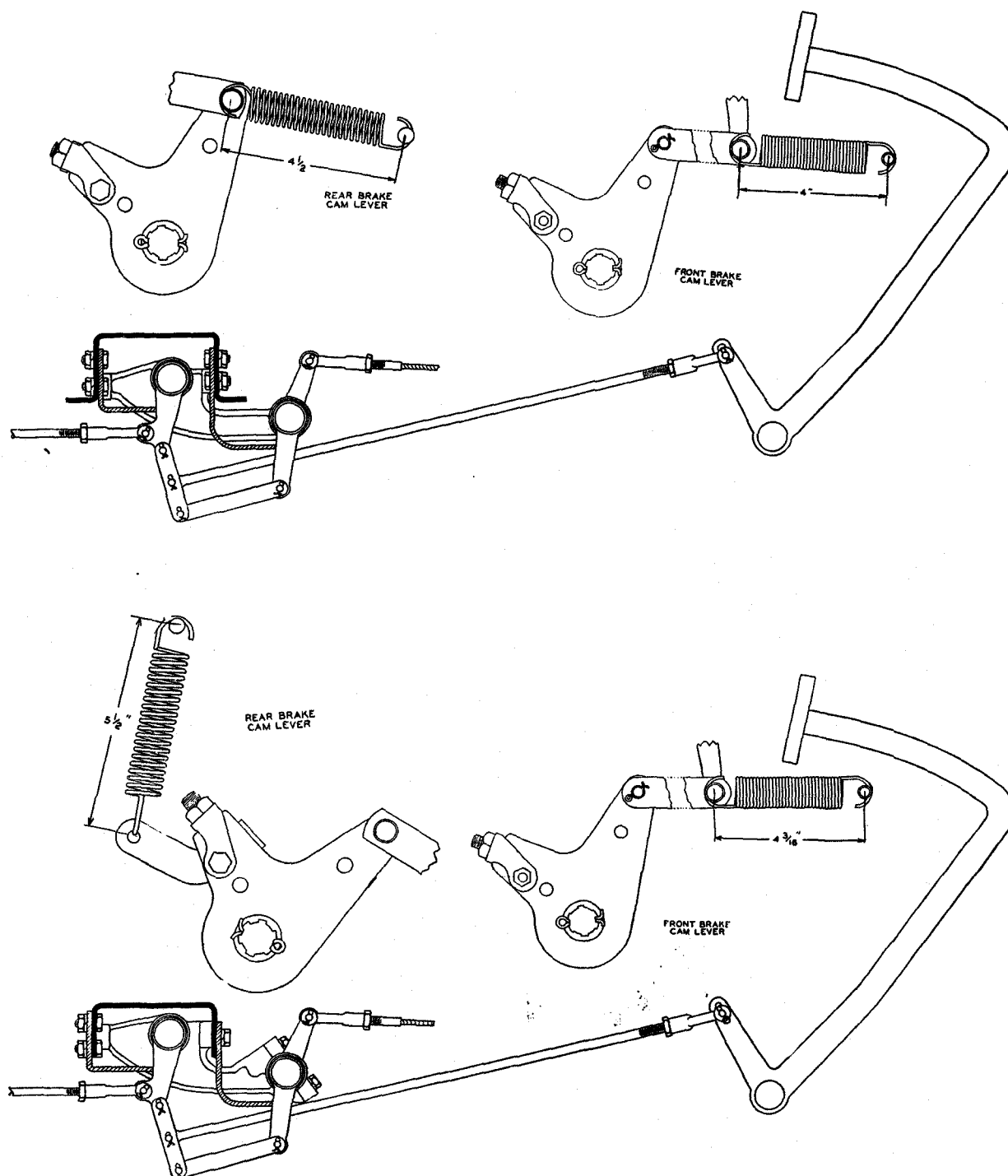


Fig. 10. The correct adjustment for the front and rear brake rods on the Cadillac is shown above, on the LaSalle, below.

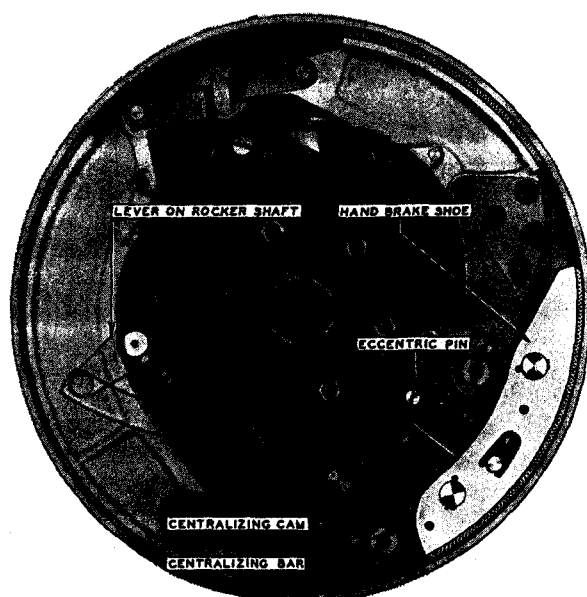


Fig. 11. The hand brake mechanism in the Cadillac left rear wheel.

adjustment consists of a cam, which bears against an arm extending from the shoe and which can be turned by means of a squared stem projecting through the dust shield. To make this adjustment, turn the cam (clockwise on right brake—counter-clockwise on left brake) until the brake just starts to drag. Then turn it in the opposite direction against the stop. Finally, turn it back half-way and tighten the lock nut.

Hand Brake Connections

The hand brakes are operated through a mechanical equalizer under the center cross-member. This equalizer is necessary because the separate shoes are not adjustable to equalize the clearance.

The hand brake pull rods should be adjusted so as to hold the equalizer bar parallel to the cross-member.

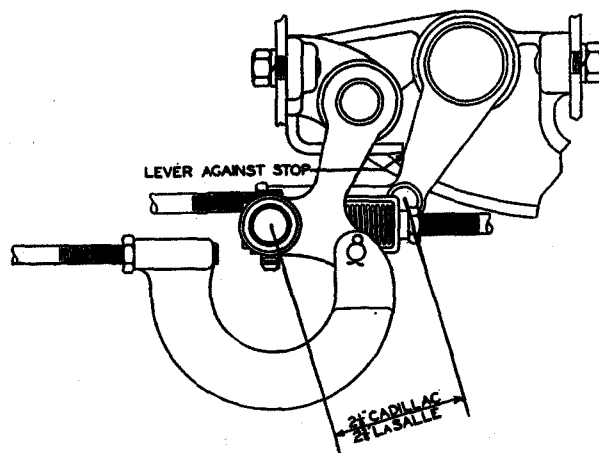


Fig. 12. Hand brake rod adjustment.

The rod between the equalizer and the hand lever should be adjusted as shown in Fig. 12. The hand brake lever should be in its released position and the foot brake lever under the cross-member should be up against its stop. The rod should then be adjusted on the Cadillac so there is $2\frac{1}{8}$ " between the center of the equalizer and the center of the pin at the front yoke of the rear foot brake rod. On the LaSalle this dimension should be $2\frac{5}{8}$ ".

Re-lining Brakes

It is recommended for the present that no attempt be made to re-line brake shoes in the Service Station. If re-lining is necessary, the shoes should be returned in exchange for factory re-lined shoes. To remove the brake shoes, disengage the locking plates on the anchor pins and remove the anchor pins.

Clutch

The plate clutch used on 341-A and later 303 cars was designed in anticipation of the new Synchro-mesh transmission and is retained in both the 341-B and 328, with the following minor changes, which also apply to both cars.

The clutch release is simplified by the use of a forked lever pivoted in a ball and socket bearing in the side of the transmission case. The adjustment of the clutch pedal rod is the same as on the previous cars.

There is no separate retracting spring for the release bearing. The bearing sleeve is connected to the forked lever by a hairpin spring which merely serves to pull the sleeve back with the lever. The clutch pedal spring is the retracting spring for the entire release mechanism.

The grease cup for lubrication of the release bearing now has a stationary mounting in the transmission case, and is connected to the bearing by a flexible tube.

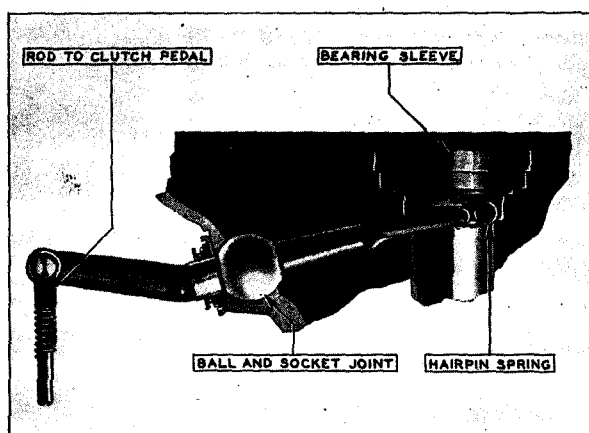


Fig. 13. Clutch release mechanism.

Cooling System

The cooling systems of the Cadillac 341-B and LaSalle 328 are the same, respectively, as the 341-A and 303, except for changes in the fan.

Cadillac

The only change in the Cadillac fan is in the fan hub, which is recessed to receive a bronze plate between the pump gears and the solid gasket. This plate takes the end thrust of the pump gears and permits the use of a thin (.015") gasket which remains oil tight longer than the thick gasket which is necessary without the plate. The new fan hub with the plate is interchangeable with the fan hub on 341-A and 303 cars.

LaSalle

The above change is also incorporated in the LaSalle 328 fan. In addition, several other changes have been made in the 328 fan to provide better cooling for the larger engine. The fan blade assembly is one inch larger in diameter, and the pitch of the blades has been increased from 25 to 33 degrees. The blade assembly is also shaped so that the blades are brought closer to the radiator.

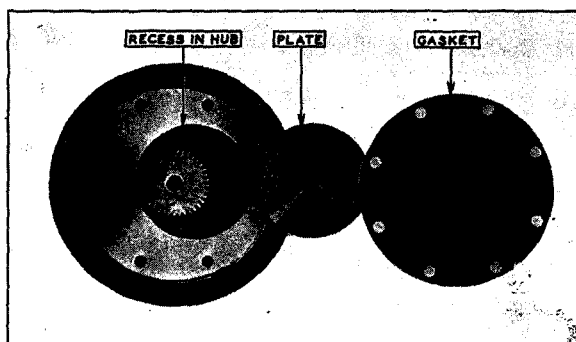


Fig. 14. Bronze plate and thin gasket used in fan reservoir.

Electrical

The electrical systems of the Cadillac 341-B and LaSalle 328 have the following improvements:

Ignition Switch Lock

The ignition switch lock is a combination ignition switch and transmission lock. The cylinder lock and switch are mounted on the instrument panel in the same manner as the Electrolock on the previous models. The operation of the lock cylinder is likewise the same. Otherwise, however, the new unit is entirely different.

Electrically, the switch consists merely of two contacts, which are connected when the lock cylinder is out, and disconnected when it is in. One terminal is connected to the coil and one to the ammeter. The switch, therefore, merely breaks the flow of current to the coil; it does not ground any part of the circuit and has no connection to the distributor.

The transmission lock is operated mechanically, NOT electrically. The lock cylinder is fastened to one end of a heavy steel wire which is carried to the transmission top cover through an armoured cable. At the transmission end of the wire is a plunger which moves back and forth as the lock cylinder moves in or out.

When the lock cylinder is in, the plunger holds down a ball between the shifter shafts, preventing the shafts from being moved. When the lock cylinder is out, the shifter shafts are free to move. The shafts are so notched that the transmission can be locked either in neutral or reverse. No attempt should be made to push in the lock cylinder when the transmission is in any forward gear, as this would be likely to kink the wire.

Removing Lock

The new switch lock can be removed from the instrument board by unlocking the lock

cylinder and removing the set screw in the socket on the back of the instrument board.

To disconnect the cable at the transmission, it is necessary to remove the transmission top cover and drive out the taper pin. This pin is driven in from the top and must be driven out from the bottom.

Keys

Each car is supplied with two different keys, one for the ignition switch and door locks, the other for the spare tire and the various package compartments. The keys can be easily identified, as the ignition key has an hexagonal end, while the package compartment key is oval in shape.

Horn

The horn is equipped with a die-cast projector, which is heavier, more durable, and more attractive in appearance. The terminals on the horn are now concealed inside the cover plate, making a neater installation.

Windshield Cleaner

The windshield cleaner consists of two wiper blades operated in tandem by an electric motor. The electric cleaner has the advantage of uniform operation, regardless of engine speed. It will require no attention from the owner. If the motor unit requires service, it should be taken care of for the present by replacement.

Distributor

The timer-distributor unit is the same, except for the advance governor, which has new advance characteristics to give the best spark timing for high compression cylinder heads. The timing marks on the flywheel are in the same position as before— $\frac{7}{8}$ of an inch in advance of center.

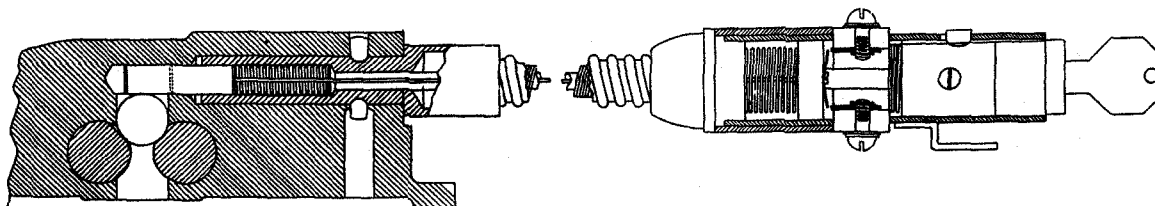


Fig. 15. Sectional view of new lock mechanism in transmission (left) and on instrument board.

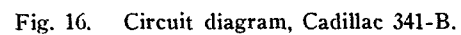


Fig. 16. Circuit diagram, Cadillac 341-B.

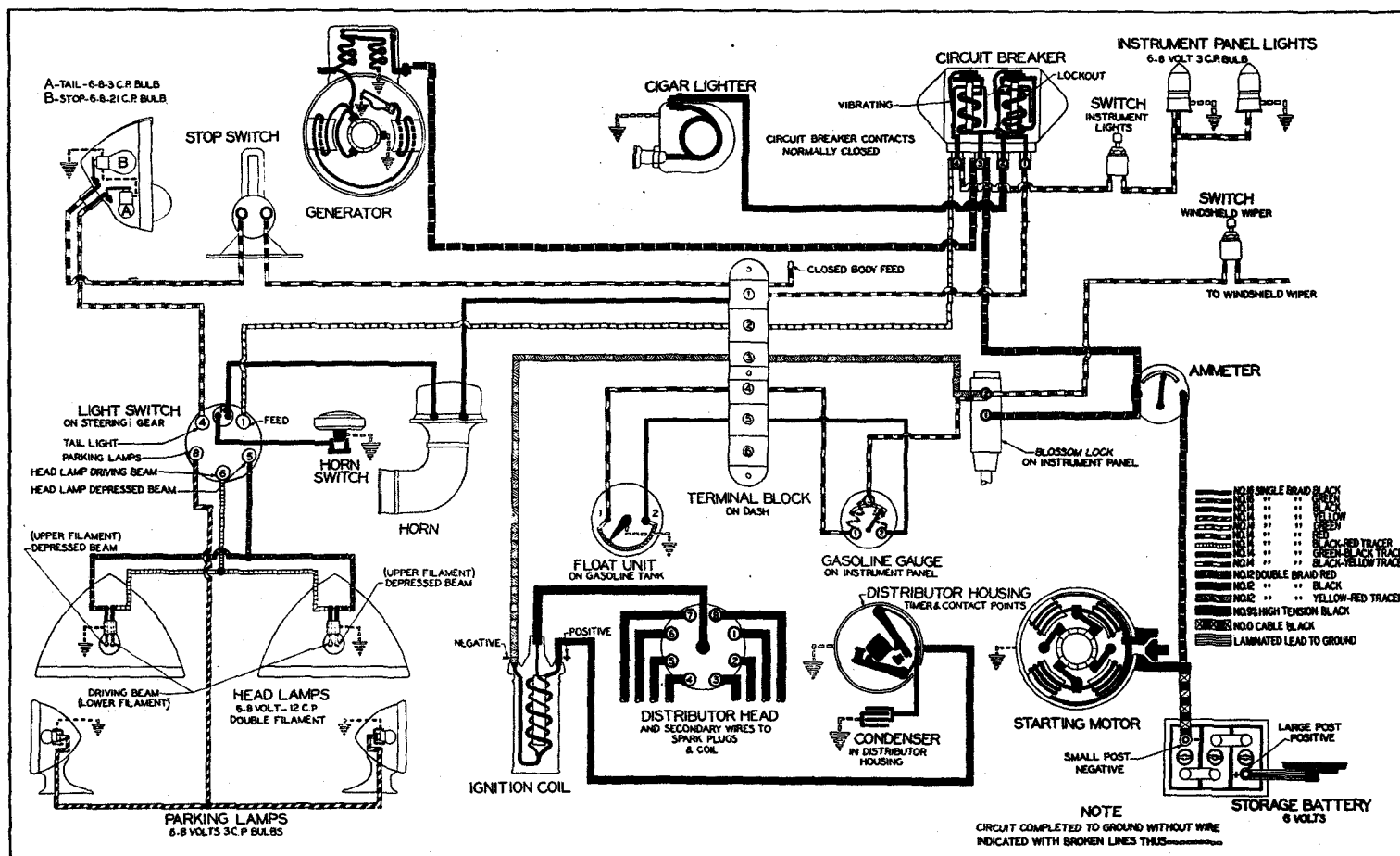


Fig. 17. Circuit diagram, LaSalk 328.

NOTE: It has been the practice to time the ignition $\frac{1}{2}$ " in advance of center on 341-A and 303 cars equipped with high compression cylinder heads. With the advance governor, high compression and low compression heads take the same timing on the flywheel.

Manipulation of Spark by Driver

As described under "Engine," high compression cylinder heads are standard on both Cadillac 341-B and LaSalle 328. Furthermore, the ignition is so timed as to give the maximum power possible with these heads when used with anti-knock fuel.

When ordinary fuel is used, it will be necessary to retard the spark slightly by the hand control, to avoid detonation. The correct setting is then at the point where there is a slight "ping" on quick acceleration. This "ping" is the best indication that the spark is timed correctly to develop the maximum power possible with the kind of fuel used.

It is important that this necessity for manipulation of the spark control be explained to car owners when they take delivery of their cars. If the matter is not thoroughly understood beforehand, unwarranted complaints of carbon knock are likely to be made and carbon deposit will be removed unnecessarily.

Engine

LaSalle Engine Larger

The bore of the LaSalle engine has been increased to $3\frac{1}{4}$ inches, which give the engine a piston displacement of 328 cubic inches. The cylinder heads, blocks and pistons are, therefore, not interchangeable with 303 parts.

High Compression

Another change which makes for greater power is the adoption of high-compression cylinder heads as standard equipment on both Cadillac and LaSalle engines. These cylinder heads have a 5.3 to 1 compression ratio, the same as the high compression cylinder heads that were optional on the 341-A and 303 cars.

These cylinder heads do not require special timing of the ignition, and the same timing marks on the flywheel are still employed. This is accomplished through the use of a new advance governor in the distributor. It is necessary, however, for the driver to manipulate

the spark control, as described under "Electrical," if other than anti-knock fuel is used.

Pistons

The pistons used in 341-B and 328 engines have a gradually tapered skirt, allowing slightly greater clearance at the top of the skirt than at the bottom when the engine is cold. With these pistons, there is a more uniform bearing on the cylinder walls at operating temperatures.

Another change in the pistons is in the fit of the piston pins, which are a tight press fit in the side on which the set screw is located and a hand push fit on the other side. This arrangement allows for free expansion of the pin when heated.

In installing these pins, they should be pressed in on the side of the piston away from the set screw. In removing them, they should be pressed out in the same direction, that is, so the pin comes out of the piston on the same side as the set screw.

CAUTION: The 341-A piston pins are just short enough to permit their being installed in 328 cylinders but they must not be so installed because they will score the cylinder walls. 328 and 341-B piston pins, which are the same length, can be identified by a V shaped groove in one end. 328 and 341-B piston pins can be used in 341-A engines but 341-A piston pins must not be used in 328 engines.

Engine Rear Supports

The engine rear supports are rubber mounted similar to those used on 341-A and later 303 cars but are 3" longer. The rubber cushions are in four sections instead of two. (Fig. 19.)

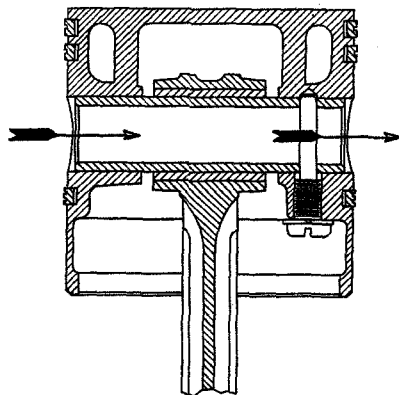


Fig. 18. Piston pins should be pressed in and pressed out in the direction shown by the arrows.

Exhaust System

A new improved type muffler is used on both the Cadillac 341-B and the LaSalle 328.

The new muffler is suspended from the exhaust pipes and requires no brackets on the frame. It is placed further forward on the car than the muffler on the previous cars. Neither the muffler nor the connecting pipes are interchangeable with those used on 341-A and 303 cars.

Frame

The LaSalle 328 frame is stamped from the same dies as the 303 frame. The frame is not interchangeable, however, as the holes for attaching some of the units are located differently.

The Cadillac 341-B frame is entirely new with deeper side bars and new cross members. It is stiffer and yet lighter than the previous frame.

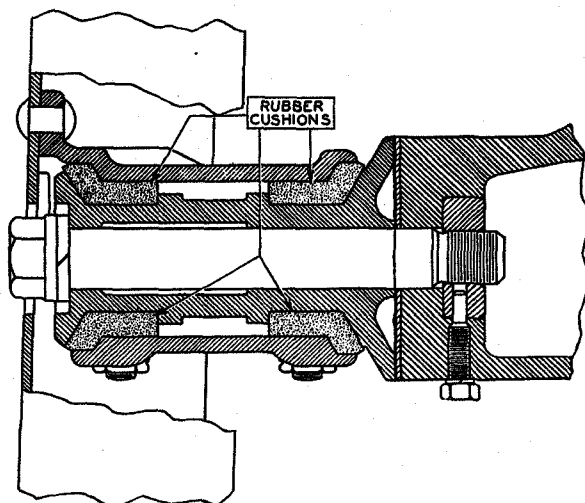


Fig. 19. Sectional view of the engine rear support.

Gasoline System

Few changes have been made in the gasoline system. The vacuum system used on the Cadillac 341-A and late LaSalle 303 cars is retained without change, except that the windshield cleaner is no longer operated by vacuum. The same vacuum check valve is mounted on the dash, but the connection formerly used for

the windshield cleaner is filled with a screw plug.

The gasoline tank is new on both cars, and is mounted differently in the frame. The feed-pipe connection has also been changed, the pipe entering at the front of the tank about half way up.

Gasoline Gauge

The gasoline gauge is an electrical gauge and is manufactured by the manufacturers of the previous gauge. It is of a new type, however, using a different electrical circuit. Neither the tank unit nor the dash unit are interchangeable with the previous units. For better appearance, the tank unit is located further forward on the gasoline tank.

To remove the gauge from the tank it is necessary to remove the cover over the rear of the tank and the two side splash shields; and the vent in the filler cap on the Cadillac. It is also necessary to drain the gasoline, disconnect the feed pipe, and remove the bolts that fasten the tank to the frame. The tank can then be rolled forward until the unit is accessible.

The connections to the new gauge are shown in the circuit diagram.

Lighting System

The most noticeable change in the lighting system of the Cadillac 341-B and the LaSalle 328 is the new location of the parking lamps on the fenders. The wiring is carried from the frame in conduits under the fenders. The circuit diagram indicates the new connections.

A new lighting switch is also used at the bottom of the steering column on both of the new cars. This switch is fully enclosed and of a more rugged design than the previous switch. Work on the connections is simplified by the use of plug-in type terminals.

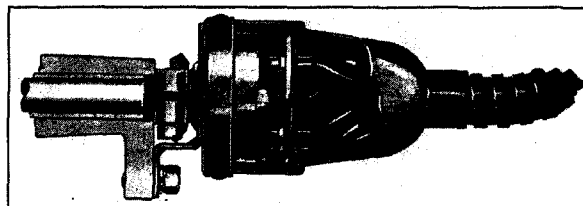


Fig. 20. The new lighting switch at the bottom of the steering column.

Lubrication

Engine Lubrication

The following improvements have been made in the lubricating system of the Cadillac 341-B and the LaSalle 328 engines.

The connecting rods are now drilled their entire length for pressure lubrication of the piston pins, oil being forced from the connecting rod bearings under pressure to the piston pins, insuring positive lubrication at all engine speeds.

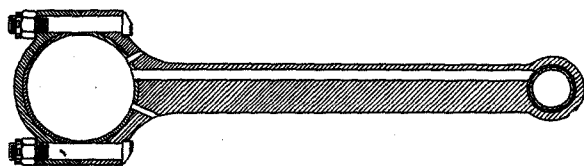


Fig. 21. Oil is forced to the piston pins under pressure through the oil hole in the connecting rod.

The test cock has been removed from the oil filter because the flow test is not always a positive test of the condition of the filter. Instead it is recommended that the cartridge be replaced regularly every 12,000 miles.

LaSalle Wheel Bearings

With the change in the rear axle packing, described under "Rear Axle," lubricant from the differential can no longer work out along the axle shafts to the wheel bearings. The LaSalle 328 wheel bearings should be lubricated separately, therefore, by packing them with wheel bearing grease every 4,000 miles. Lubrication of the rear wheel bearings is therefore the same as for the front wheel bearings.

Lubrication Chart

A new type of lubrication chart is now included with each copy of the operator's manual. It is urged that service stations follow this chart in lubricating the new cars.

Special Tools

The Cadillac 341-B and LaSalle 328 are so designed that they can be serviced for the most part with the special tools that have already been released.

Brake adjustments, however, can be performed with greater ease if a special wrench is used. A brake adjusting wrench with a $\frac{3}{4}$ -inch box opening has accordingly been designed. The tool number is 109229, and the net price is 50 cents each.

Springs

The springs and spring suspension on the LaSalle 328 are identically the same as on the 303.

The Cadillac 341-B is equipped with an improved type of spring shackle at the rear ends of the front springs. The shackle plates are longer and thinner than those on the 341-A, and allow more flexible spring action.

The shackles at the front end of the rear springs are now of the ball and socket joint type similar to the rear shackles.

The Cadillac 341-B is equipped with double-acting Delco-Remy-Lovejoy hydraulic shock absorbers, which cushion the springs on compression as well as check the rebound. These shock absorbers have two cylinders and two

plungers or pistons (Fig. 23). The action of the shock absorbers is regulated by metering pins each of which is attached to and is removed with a screw plug in the bottom of the cylinder. The metering pins must not be interchanged. The compression pins can be easily identified from the rebound pins as the compression pins are marked with letters, while the rebound pins are marked with numbers.

The shock absorbers are connected to the axles by means of rods fitted at the ends with ball and socket joints. Rubber cushions furnish the necessary pressure on the sockets.

The shock absorbers on the LaSalle 328 are the same type as on the 303.

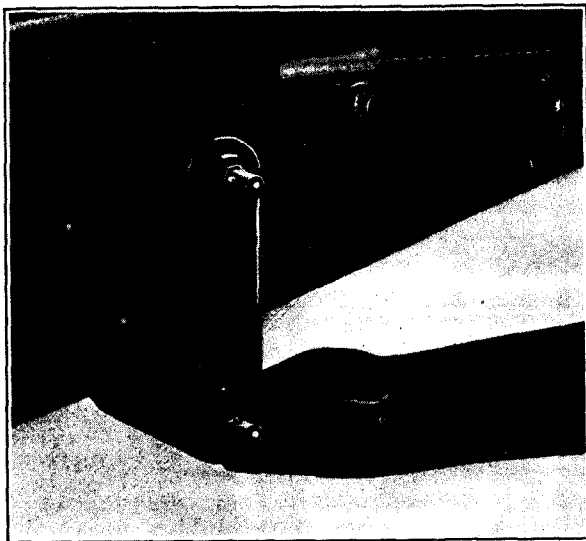


Fig. 22. The new Cadillac front spring shackles are longer, thinner and more flexible.

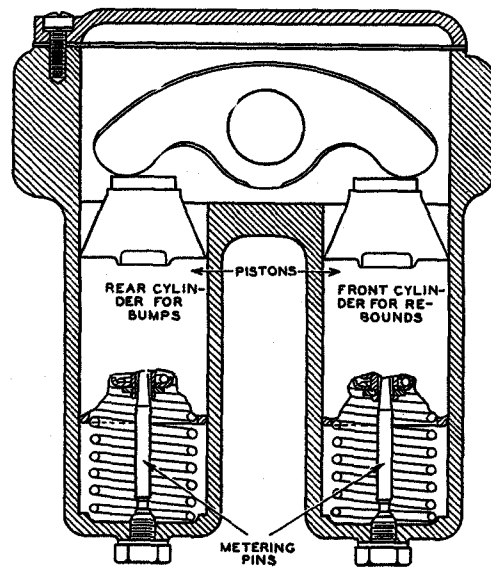


Fig. 23. Sectional view of the double-acting shock absorber used at the rear on the Cadillac 341-B.

Steering Gear

The steering gear used on the Cadillac 341-B and LaSalle 328 is the same as on the late 341-A and 303 cars, except for the following:

The angle of the steering gear on 328 open cars is 42 degrees 15'; and on closed cars it is 44 degrees 28'. As these angles are different than the angles of 303 cars, the steering gear housings are not interchangeable.

The angle of the steering gear on 341-B open cars is 41 degrees 10', and on closed cars it is 42 degrees 25', so that the 341-B housing is not interchangeable with the 341-A. The sector on the 341-B is not interchangeable with the 341-A sector.

The steering tubes on the 341-B are also shorter than those used on the 341-A, and these tubes are therefore not interchangeable.

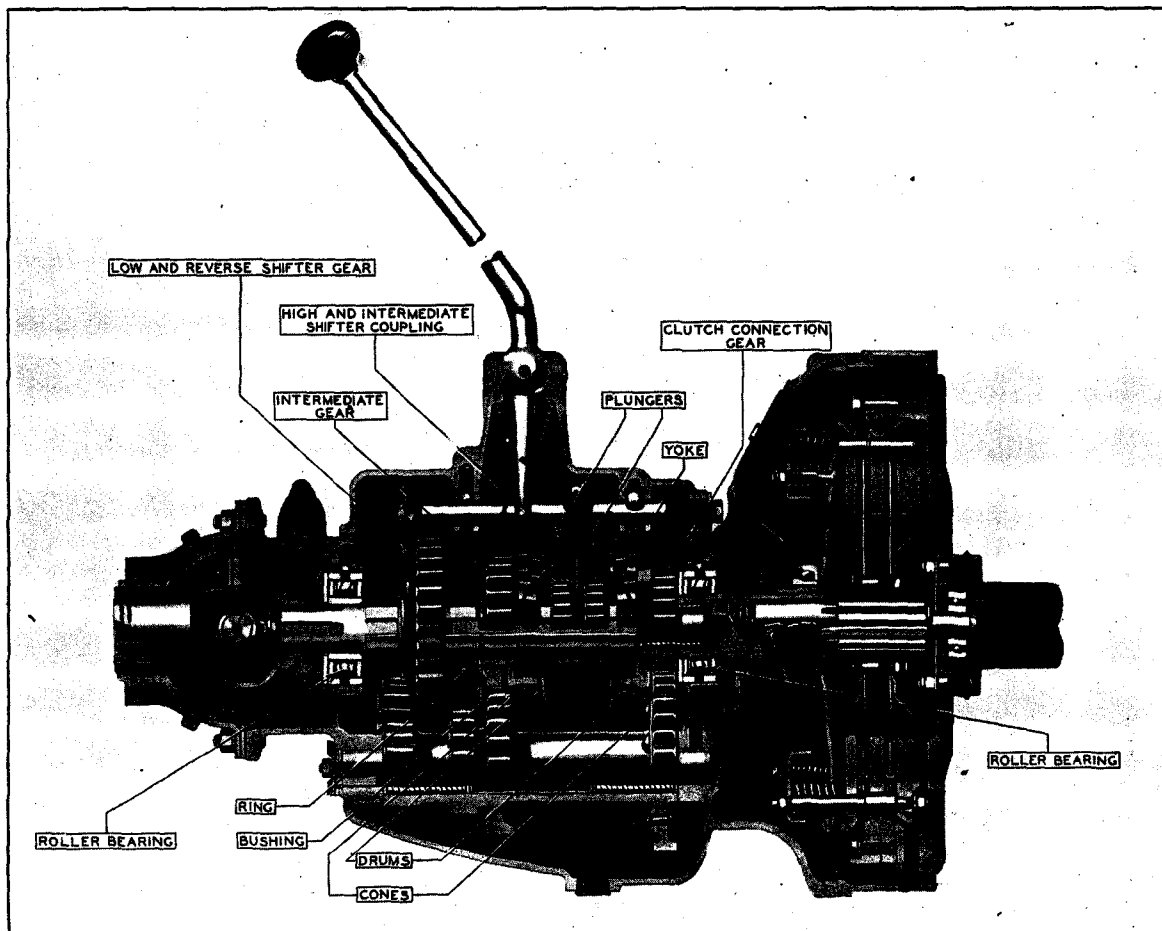


Fig. 24. Sectional view of the new Synchro-mesh transmission used on both 341-B and 328 cars.

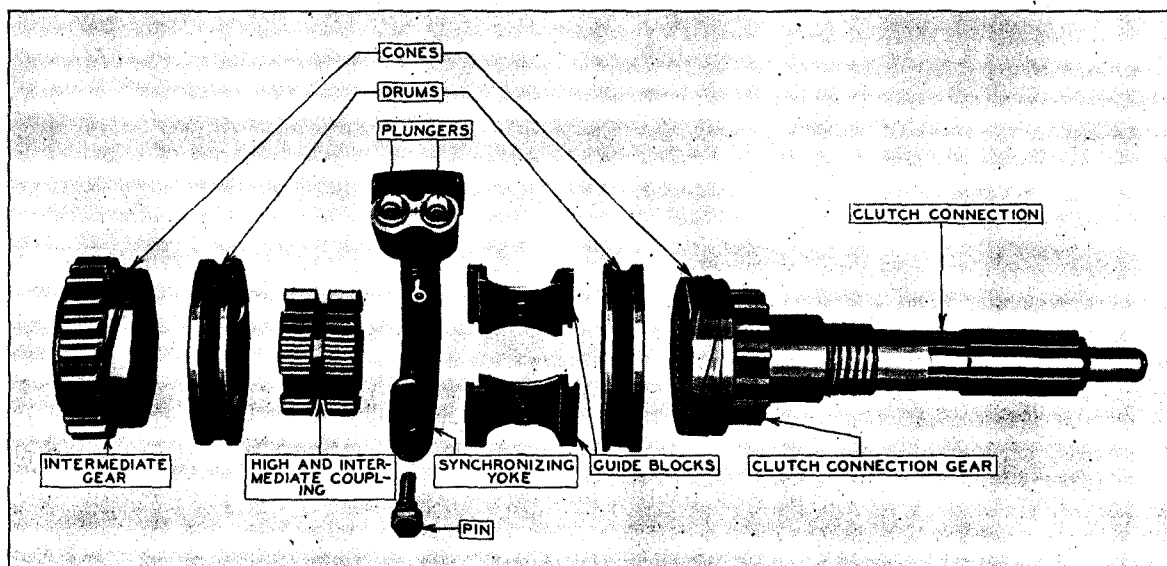


Fig. 25. Synchronizing mechanism disassembled.

Transmission

The Cadillac 341-B and the LaSalle 328 are both equipped with a new type of transmission called the Synchro-mesh transmission. This new transmission makes gear shifting as simple and noiseless as steering. It is operated practically the same as the conventional transmission, having the same gear changes and the same positions of the control lever.

The only difference in operation is in timing the movement of the control lever. The movement of the lever can be completed in less time than with the conventional transmission, but instead of a jerky movement with a period of hesitation in neutral, the movement of the lever must be smooth and deliberate enough to give the synchronizing mechanism a chance to act.

Synchronizing Mechanism

The synchronizing mechanism is not applied to low and reverse because shifts into low and reverse are made when the car is standing still. There is, therefore, no fundamental change in these gears. The chief difference in the high and intermediate gears is that the intermediate gear on the main shaft is in constant mesh with the jack-shaft. To make this possible, the intermediate gear is not splined, but revolves free on a bronze bushing, which is splined to fit the main shaft.

The drive is through a sliding coupling which takes the place of a shifter gear. This coupling is splined to fit the main shaft and has teeth on the outside which engage with teeth cut internally on the intermediate gear. Similar teeth are cut internally in the end of the clutch connection gear.

The synchronizing mechanism consists primarily of two cone-type friction clutches, one for intermediate and one for high gear. Each clutch consists of a sliding drum which revolves with the main shaft, and a bronze cone one of which is mounted on the intermediate gear and the other on the clutch connection. Although the drums are placed between the coupling and the gears, they do not prevent the coupling from sliding into mesh with the teeth in the gears, because the drums are spoke-shaped, the coupling being recessed opposite the spokes of the drums.

The synchronizing drums are moved forward and backward into contact with their respective cones by means of a rocking yoke, which is pivoted on trunnions in the sides of the transmission case. This yoke is held in

the neutral position by springs, in which position there is clearance between each cone and its drum.

The movement of the yoke is accomplished through a bevel-shaped cam machined on the hub of the high and intermediate shifter fork. This cam engages the rollers of two plungers which slide up and down in the upper part of the yoke. The cylinders in which the plungers slide are filled with oil, forming dash-pots. The oil in these dash-pots must escape through a small hole before the plungers can descend.

Operation

The operation of the synchronizing mechanism is shifting from neutral to intermediate is briefly as follows: As the control lever leaves neutral, the yoke is rocked by the pressure of the cam against the roller in the plunger, and this moves the synchronizing drum into contact with the cone on the intermediate gear. The gear is thereupon rapidly brought to the same speed as the drum.

Meanwhile, the plunger has been moving downward in its cylinder, letting the roller travel along the bevelled surface of the cam. As soon as the roller reaches the end of the bevel on the cam, the yoke is released and the drum is at once disengaged from the cone.

At this point, further movement of the control lever moves the sliding coupling into mesh with the teeth in the gear. This is accomplished noiselessly because the coupling and the gear are revolving at the same speed.

A similar series of operations takes place when the transmission is shifted from neutral to high.

Adjustment of Yoke Movement

The amount of movement of the yoke is controlled by the clearance between the cones and the drums. This movement can be checked by removing the transmission top cover and holding a scale along on the top edge of the transmission case, while prying the yoke back and forth. The travel of the yoke should be from 3-32 to 5-32 of an inch from neutral to either extreme position.

The amount of clearance between the rear cone and its drum is determined by the thickness of the snap ring which locates the bronze bushing for the intermediate gear. This ring is supplied in the following thicknesses: .069, .079, .085 and .094.

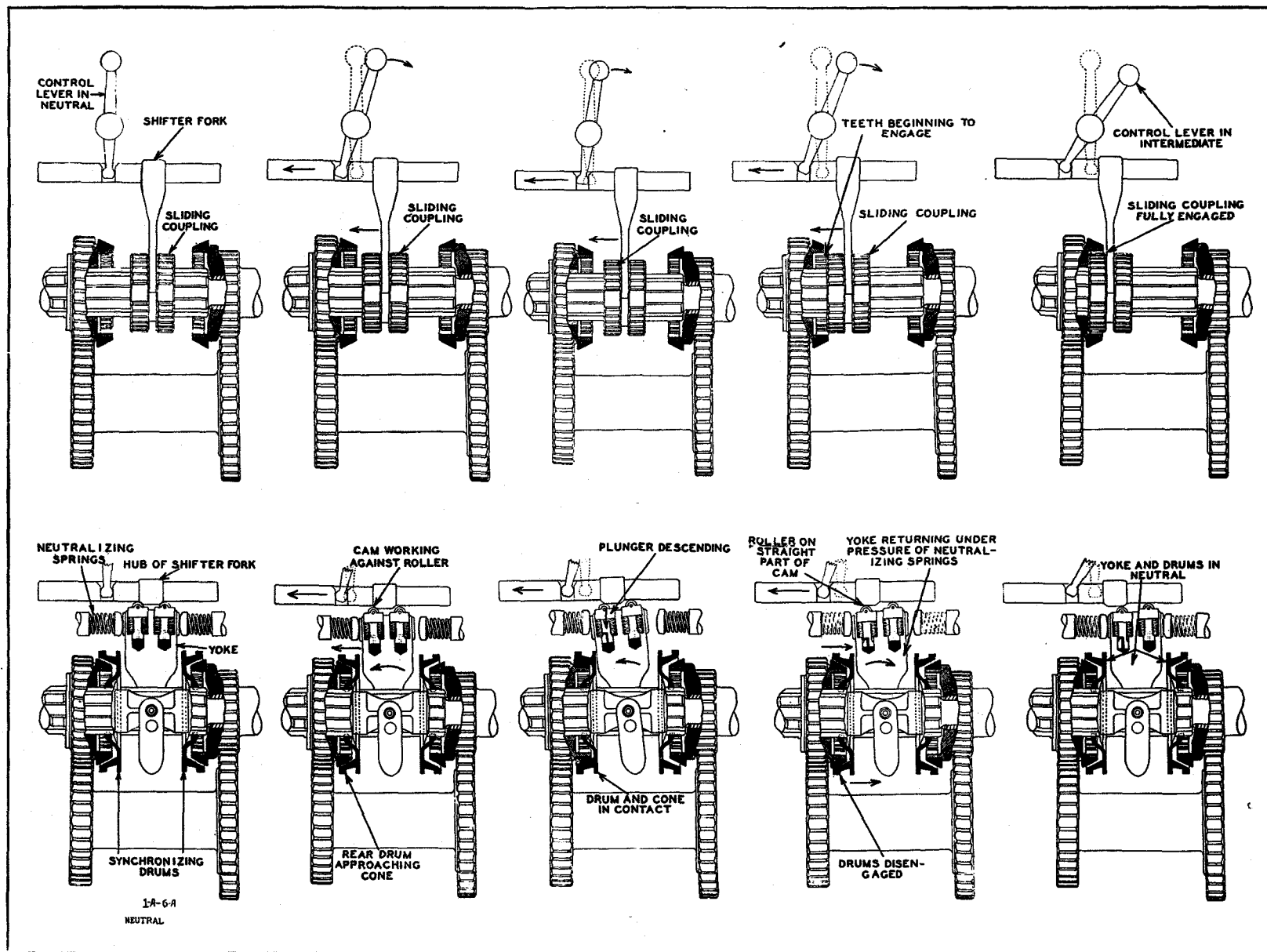


Fig. 26. Diagrams of operations in shifting from neutral to intermediate. The gears and synchronizing mechanism are shown separately for clearness. Actually, they are assembled together.

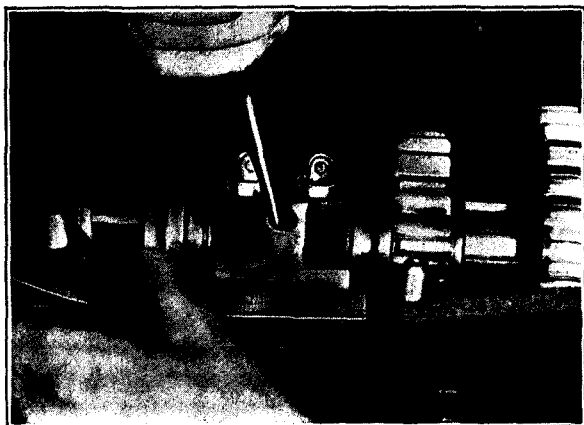


Fig. 27. Measurement the movement of the yoke which determines the drum clearance. This should be from 3-32" to 5-32".

The amount of clearance between the front cone and its drum is determined by the number of gaskets between the front bearing cap and the transmission case. Increasing the number of gaskets moves the clutch connection farther forward and thus increases the clearance between the front cone and the drum.

Changing the number of these gaskets also affects the end play between the main shaft and the clutch connection. This end play should not exceed .020 inch.

The foregoing adjustments are all correctly made when the transmission is assembled at the factory and need be given consideration

in service only in the event that disassembly and replacement of the drums or the gears on which the cones are mounted, becomes necessary.

Dash-pot Plungers

The plungers in the yoke are so constructed that the synchronizing mechanism will function uniformly under varying conditions of temperature affecting the viscosity of the oil. Fig. 29 shows the construction of these plungers.

The plunger which carries the roller is separate from the piston which is an oil tight fit in the cylinder. The two parts are fastened together by a pin, which passes through a slotted hole in the plunger so as to allow up-and-down movement of the plunger with respect to the piston. The lower end of the plunger forms an oil tight valve seat where it meets the piston.

The lower end of the plunger also carries a conical valve which is held closed under the tension of a conical valve spring. The valve has a small hole drilled in one side.

The cylinder is filled with oil to begin with and is kept filled by oil thrown up by the gears into the hole in the yoke.

The operation of the plunger is as follows:

On the downward stroke, when the cam is working against the roller, the downward movement is retarded by the oil below the piston, which must escape either through the

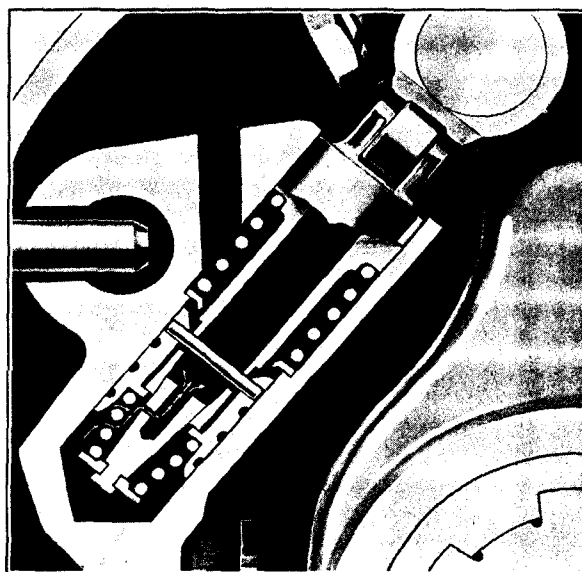
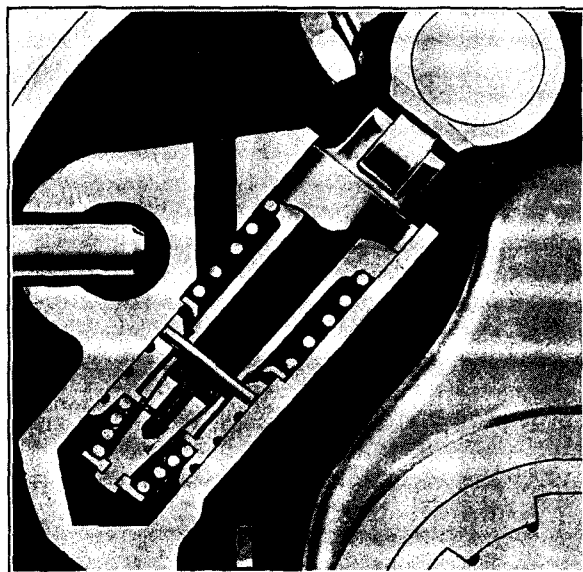


Fig. 28. The arrows show the travel of oil through the plunger valve when the oil is cold, (at left), and when it is warm (at the right).

small hole in the valve or around the valve, if sufficient pressure is built up in the chamber to open the valve.

The small hole is of such a size that, when the oil is hot, it alone provides a sufficient outlet for the oil to control the period of synchronization (Fig. 28). When the oil is cold, however, enough pressure is built up below the piston to open the conical valve which gives the larger passage required by the oil when it is cold and heavy. If it were not for this valve, the period of synchronization would be unnecessarily long when the oil is cold and the movement of the control lever would be too slow.

On the upward stroke, which takes place as the control lever is shifted back into neutral, the plunger moves up under the pressure of the main spring. The piston, however, stays down until the plunger opens the passage between it and the piston, whereupon oil flows through this passage to refill the chamber below the piston, which then rises with

the plunger. When the plunger reaches the top of its stroke, the piston continues upward under the pressure of the conical spring until the refilling passage is closed. The mechanism is then ready for another downward stroke when the next shift is made.

Other Details of Construction

The shifter shafts and forks are a part of the top cover assembly, the removal of which gives access to the rear of the transmission. There is no bottom cover, thus eliminating chance for oil leakage. All servicing is done through the top opening.

The main shaft and clutch connection revolve on roller bearings. Bronze plates take the thrust of the synchronizing drums during shifting, as the ball bearings formerly used in the transmission would not resist this end-thrust without allowing too much end-play in the shafts.

Universal Joint

The universal joint is the same as on the 303 and 341-A, but the ball and socket joint construction is slightly different. The housing which was formerly bolted to the transmission case is now cast as an integral part of the case.

The ball member, to which the torsion tube is bolted, works between an inner and an outer socket member. Play in the joint is controlled by the number of gaskets between the inner and outer socket members.

Dissassembly

The only part of the dissassembly and reassembly that differs greatly from the methods used on the previous transmissions is the assembly of the main shaft. When assembling the transmission main shaft, follow this procedure exactly:

With the yoke and guide blocks in position place the front drum in position on the clutch connection. Place the sliding coupling in mesh with the internal teeth in the clutch connection. Then place the rear drum in the intermediate gear and rest the gear on top of the intermediate gear on the jackshaft, making sure that flange of the drum fits in the recesses of the guide blocks.

Slide the main shaft in through the rear of the transmission, threading it carefully in turn through the low and reverse shipper gear, the intermediate gear bushing, the rear drum, the sliding coupling, the front drum and finally into the roller bearing in the clutch connection.

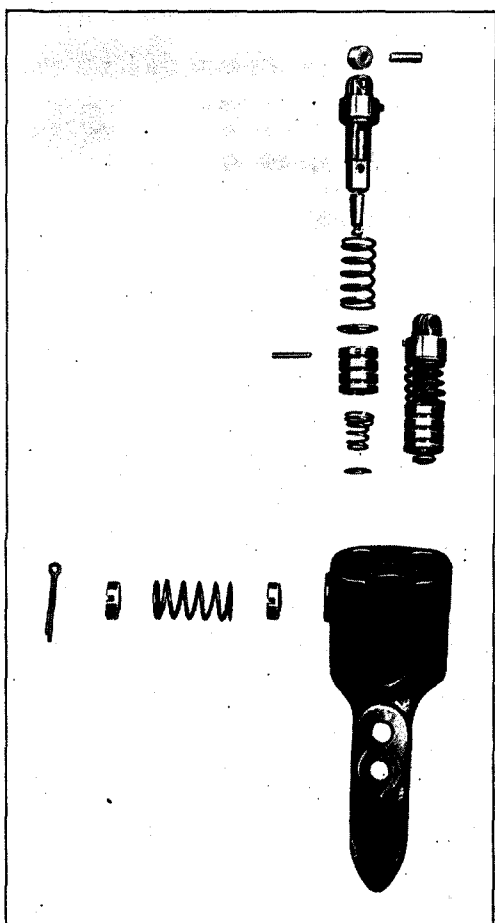


Fig. 29. Yoke and plunger mechanism disassembled.

The jackshaft is removed with puller 100228 in the same manner as the 341-A jackshaft, except that the jackshaft gears must be removed through the top of the case.

Speedometer Drive

The speedometer driving gears and pinions on the 341-B and 303 are entirely new. The same driving gear, having seven teeth, is used for all axle ratios on both cars, the difference being entirely in the number of teeth on the pinions, which varies from 16 to 23.

The pinions with from 16 to 19 teeth have a different center distance than pinions with 20 to 23 teeth. In order to accomplish this, the end of the speedometer cable is eccentric. In one position it gives the correct center distance for pinions with 16 to 19 teeth. When revolved 180 degrees, it gives the correct distance for pinions with 20 to 23 teeth.

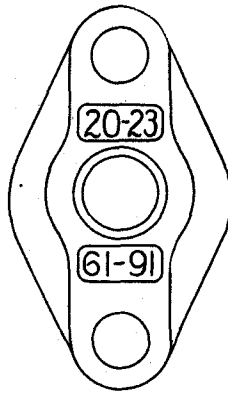


Fig. 30. The speedometer cable flange should be installed so that the number of teeth on the pinion is at the top.

The flange of the cable end has the figures "16-19" on one side and "20-23" on the other side. The cable should always be turned so that the figures corresponding to the number of teeth on the pinion are on top.

Wheels, Rims, Tires

New Tire Sizes

A new method of designating tire sizes has been recently adopted and the tires of the new cars will soon be marked according to the new system. This method gives first, the actual diameter of the cross-section of the tire and then the diameter of the rim or wheel on which it is used. For the present, tires will also carry the old marking in small figures.

The tires used on the Cadillac 341-B are the same size as on the 341-A (32x6.75) and will be marked 7.00—20 according to the new system.

The tires on the LaSalle 328 are different in size from the 303 tires and according to the new system are marked 6.50—19 corresponding to the 31x6.20 in the old system.

LaSalle Wheels

The wheels used on the LaSalle 328 are one inch smaller in diameter than those used on the 303. The new wheels have a rim diameter of 19 inches and take the tire size mentioned above.

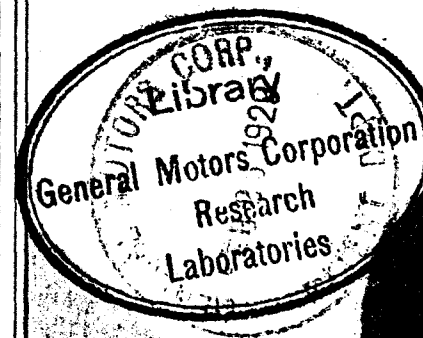
The LaSalle wheels are now fitted with chromium-plated shields over the hubs instead of having the hubs themselves plated. These shields can be removed after removing the hub caps.

CADILLAC MOTOR CAR COMPANY
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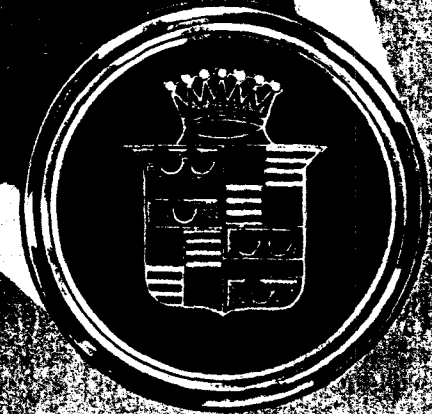
CADILLAC

MECHANISM
AND
COACHCRAFT

FUNDAMENTAL PRINCIPLES
AND VITAL REFINEMENTS



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CADILLAC

MECHANISM AND
COACHCRAFT

*FUNDAMENTAL IMPROVEMENTS
AND VITAL
REFINEMENTS*



CADILLAC MOTOR CAR COMPANY
DETROIT, MICHIGAN

Details of Construction

—•—

IN the extensive line of beautiful new models created by Cadillac this year all the qualities and features that have made Cadillac world famous are retained and given greater meaning by the addition of many extremely important advances in automotive engineering that greatly increase the appeal of the car through adding to the ease of operation and riding qualities, and by contributing markedly to greater safety.

These various improvements are of tremendous importance; in fact, it is likely that they will be regarded as of equal importance with some of the most epochal engineering advances ever introduced by Cadillac.

The principal ones are as follows:

1. The new Cadillac Syncro-Mesh silent shift transmission—an ingenious and entirely new Cadillac designed transmission that eliminates the gear shifting trouble experienced with conventional transmission and that adds greatly to “get-away” in traffic.
2. The new Cadillac designed Duplex-Mechanical system of effortless four-wheel brakes—the most scientific, costly and efficient ever developed. Two independent systems. Internal shoe type. Enclosed. Long-lived. Minimum of pedal pressure. Only a simple outside adjustment required for each brake.
3. The use of Security-Plate glass on all bodies, which eliminates the hazard of flying glass.
4. New adjustable front seats—a device whereby the entire front seat in closed models may be easily moved to suit the driver.
5. Pneumatic Control in Engineering—principles of pneumatic control in construction assuring maximum quietness. Bodies incorporating features of outstanding strength, roominess, comfort—and the last word in style. The finest products of Fisher and Fleetwood.
6. New modernity in finish and appointment—deep, rich upholstery. New fittings. Deft and pleasing treatments in fabrics and trim.
7. The use of chromium plating on all exposed nickel parts such as radiator shell, cowl band, bumpers, door handles, running board mouldings and so on, that assures permanent luster.
8. Refinements and improvements in the famous Cadillac ninety-degree, V-type eight that make this engine more smooth, silent and powerful.

One of the most important of these improvements is the new Cadillac designed Syncro-Mesh transmission. Up to the present, the matter of gear shifting has been a conscious mental strain for all but the most expert drivers. The new Cadillac Syncro-Mesh transmission will end this for all time, for this transmission is such that any driver can shift gears quickly, effortlessly and without clashing. This transmission will be explained more fully farther along in this book.

The new Duplex-Mechanical four-wheel brakes are entirely new in design, known as the internal shoe type. They not only give a considerably greater degree of efficiency than the old system employed but they also require much less effort on the part of the driver.

When to this is added the introduction of Security-Plate glass which eliminates the hazard of flying glass caused through accident, then there are two safety factors the value of which cannot be overemphasized.

Chromium plating, too, which prevents tarnishing of exposed nickel parts is a feature that will have a real appeal.

The introduction of this special finish means that exterior nickel parts of the car will retain their brilliancy and polish. Apart from the question of appearance, the labor-saving advantage of this finish must also be considered.

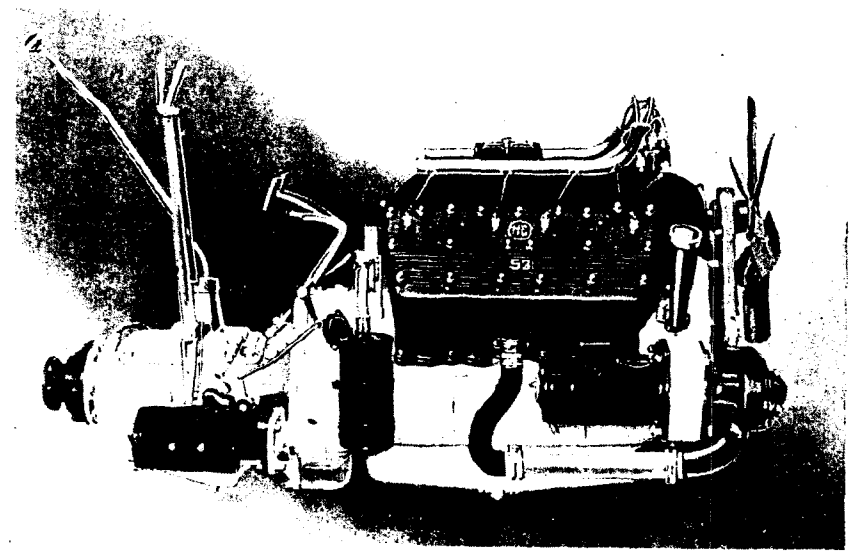
There are, of course, a hundred and one smaller refinements and details, each designed for a special reason, which accomplish a definite purpose and which contribute in their entirety to the superior standards of motor-ing only obtainable in Cadillac.

In addition to the line of Fisher bodies an entirely new and widely varied line of special Fleetwood custom built bodies is available, representing the ultimate in modern custom coachcraft and the last word in luxury and individuality. Among these Fleetwood bodies is an entirely new and unique body type, the All-Weather Phaeton, having a distinct appeal of its own.

These, then, are the more important changes, improvements and refinements introduced into the Cadillac line.

Flexible to an astonishing degree, with surging power at the touch of the throttle; vibrationless at all speeds; remarkably safe through the new four-wheel braking system and through the protection afforded by Security-Plate glass; with an ease of control surpassing belief; with gear shifting no longer an annoyance, and possessing dependability that has become synonymous with the word Cadillac—such is a brief summary of the mechanism of the new Cadillac.

Added to this is a choice of bodies, each individual, exquisite in line and proportion, the most advanced development of the coach builders' art, the finest expression of beauty and luxury in Cadillac's long history of success. The more salient mechanical features and details of body construction are illustrated and described in the following pages.



The famous compensated, ninety-degree, V-type, eight-cylinder engine, corner stone of Cadillac supremacy, remains unchanged in basic dimensions but is refined and improved for increased power output. Inherently smooth running, sturdy, simple, and efficient

PART I

PRINCIPAL MECHANICAL FEATURES OF CADILLAC

The Engine

CHIEF among the factors responsible for the outstanding performance of the Cadillac is the famous compensated ninety-degree, V-type, eight-cylinder engine. In this engine the cylinders are arranged in two blocks of four, at an angle of ninety degrees to one another.

This type of power plant is an achievement in itself, an engine that is the newest, most advanced development of modern automobile practice, an engine that has proved itself without equal for flexibility, long life, smooth, velvety flow of seemingly inexhaustible power and general all-round performance.

The success that this engine has achieved is due to the fact that the principle upon which the design is based is fundamentally right.

Except for one signal departure, the development of automobile power plants has proceeded upon a single principle. That principle was

present in the first one-cylinder engine. As public understanding of motoring developed into a demand for improved performance, the principle was expanded by the obvious process of increasing the number of cylinders.

To the single cylinder, the engineers early added a second, which in standard practice quickly came to be located behind the first one. To this pair, two more cylinders were added within a few seasons to provide the four. Another pair added to the line gave the six. And of recent years still another pair has given the eight-in-line engine.

The result has been a continuous improvement—larger, more powerful, more smoothly running engines. But at no time in all this lengthening of the engine has a new principle been involved.

The sole exception to this development was achieved by Cadillac; and in departing from standard practice, Cadillac engineers were influenced by two fundamental convictions:

First: That the ultimate development of fine motor car transportation was possible only with eight cylinders—a conviction with which the industry is today in substantial agreement.

Second: That to lengthen the line of cylinders indefinitely was unsound in theory, and that a really fine eight-cylinder engine must be based on a new principle.

Then Cadillac evolved and created the compensated ninety-degree, V-type eight engine, which, in effect, is two four-cylinder engines set side by side at an angle of ninety degrees and built into one.

With this engine it has scored a success which is a brilliant triumph for its basic principle.

The motoring public has itself written the account of that success in the form of sales records. For Cadillac sales have exceeded the total volume of all other cars of the same price or higher. And the motoring public has invested in cars powered with the Cadillac ninety-degree, V-type eight, a total of more than one billion dollars—an imposing volume, approximately one-third of which was made in slightly more than the past three years.

In the new Cadillac this famous engine is even more powerful, more smooth, more flexible because of the refinements and improvements.

ENGINE SIZE AND POWER

The New Cadillac engine has a piston displacement of 341 cubic inches. The bore is $3\frac{5}{16}$ inches and the stroke $4\frac{1}{8}$ inches.

The S. A. E. horsepower is 35.1 but the actual power output is more than 95 horsepower.

CHIEF FUNDAMENTAL ADVANTAGES

In the Cadillac engine the following advantages are readily apparent:

1. Smooth, Velvety Power

Equally spaced and overlapping power impulses provide a flow of smooth, velvety power. Because of the ninety-degree angle between the cylinder blocks, the power impulses occur at equal intervals. Firing at each quarter turn of the shaft, two cylinders are together all of the time exerting a driving force on the crankshaft. The resultant overlapping of power impulses builds up the flexibility that assists in giving the Cadillac its remarkable acceleration. These two features combine to produce an eager surge of power.

2. Compactness Which Permits Use of Short Crankshaft

Because there are two cylinder blocks, of four cylinders each, placed opposite each other at an included angle of ninety degrees, rather than end to end, the engine is very short and extremely rigid. The chief advantages of this construction are a short and sturdy crankshaft and the elimination of vibration at its source. Furthermore, because of the short crankshaft, three main bearings are amply sufficient to provide an abundance of support.

In addition, this results, also, in simplicity through the reduction of parts. A still further benefit of this compactness is lighter weight per horsepower.

3. The Most Efficient Carburetion and Fuel Distribution

The basic design of the Cadillac engine permits of the most efficient carburetion and fuel distribution.

In the Cadillac engine the carburetor is placed in the heated space between the cylinder blocks where conditions are most favorable for rapid and effective vaporization of the gasoline. Since the engine is short, the distance to be traversed by the fuel is also short.

But Cadillac design accentuates this advantage. In its position between the cylinder blocks, the carburetor is placed in the center with the inlet ports grouped about it.

From it the fuel takes a short, direct path to its point of use, reaching the combustion chambers in its most volatile state.

One of the chief advantages of this is that the quality of the mixture is the same in each cylinder, an extremely important factor that adds greatly to the performance of the engine.

4. Cadillac Engine Design is Simple

The ninety-degree, V-type eight used in Cadillac is simple because it has few working parts, and because these are arranged for effective and continuous operation and for easy accessibility when attention is required.

Thus, a single carburetor serves every possible need without resorting

to the double carburetors or twin types sometimes needed in other engine designs.

Three main bearings support the short crankshaft in precise alignment as against the seven or nine required in engines of greater length. Only four crank throws are required. All-in-line engines require a crank throw between every cylinder.

A single water pump and single oil pump serve the engine. A short, single camshaft operates the valve lifters directly, without need for intervening parts.

5. Long Life

Freedom from trouble and dependability are dominant characteristics and engine wear is reduced to a minimum chiefly through the following two factors:

a. Maximum and Uniform Cooling

In the Cadillac the entire volume of circulating water is kept within a small area, reaching easily the most remote recesses of the cylinder blocks, and traveling in direct routes back to the radiator. A single water pump maintains an abundant volume of circulation.

b. Highly Efficient Lubrication.

Efficient lubrication is incidental to the compactness that is a salient feature of the Cadillac engine. So short is the crankshaft that it is sufficiently supported by three main bearings, without need for the five, seven or more bearings sometimes found in other engines.

All bearings are within a short distance of the oil pump and are equally supplied from it; and each presents to the shaft a wide expanse of surface from which oil does not quickly drain away.

All cylinders, too, are near the central source of oil pressure and are well lubricated. In all these ways, this Cadillac engine design promotes long life and smooth day-by-day performance.

THE CADILLAC COMPENSATED CRANKSHAFT

When in 1923, after years of research, Cadillac engineers evolved the principle upon which is based the design of the Cadillac compensated crankshaft, there was aroused a new conception of fine motor car performance and there dawned a new era in Cadillac's already brilliant history of engine achievement.

The compensated crankshaft is one of the greatest factors contributing to Cadillac's perfect engine performance. By the system of balancing and compensating, any period of vibration which might tend to start at any speed of the crankshaft is prevented. The result is an even flow of perfectly smooth power throughout the whole range of speed.

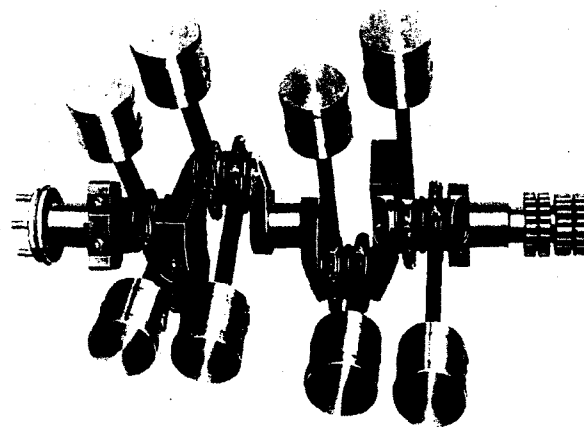
The crankshaft has four throws, or cranks, in two planes at right angles to each other, rather than all in one plane, as in other types of

V-eights. Four compensators, of forged steel, are secured to the crankshaft. After manufacture, each crankshaft, with its compensators and weights representing the connecting rods and pistons, which later are to be assembled with it, is balanced on a special machine.

The weights of the compensators are so calculated that their centrifugal effect causes the whole assembly—crankshaft, connecting rods, and pistons—to operate with the smoothness of a balanced flywheel.

RIGIDITY OF CRANKSHAFT

Among the forces acting on the crankshaft of an automobile engine are torsional forces, tending to twist the shaft. This tendency is obviously



The compensated crankshaft assembly—Cadillac's epochal contribution to V-type, eight-cylinder design

more marked in a long shaft than in a short one. Because of this inherent defect, Cadillac engineers have never approved of a long crankshaft. Even with its extreme shortness, the Cadillac crankshaft has the large diameter of $2\frac{3}{8}$ inches. This gives the crankshaft a great degree of rigidity.

BEARINGS

Three main bearings support the crankshaft. A smaller number of long bearings is preferable to a larger number of short ones for two reasons. *First*, positive lubrication over the entire bearing surface is assured. *Second*, the bearings are more easily aligned and the load equally distributed among them.

Although the compensated crankshaft of the Cadillac engine relieves the bearings of all duty except loads due to weight of parts and the power impulses, other forces being completely neutralized, the bearings are of large diameter and of ample length.

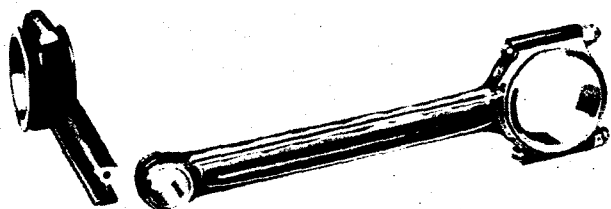
CONNECTING RODS

A striking feature of the Cadillac engine, and responsible for a higher degree of engine efficiency, is the mounting of the connecting rods to the crankshaft. Rods from the opposite cylinders are placed side by side, on the same crank throw. The connecting rods which are of I-beam section, are of drop-forged alloy steel, and are gun drilled for wrist pin lubrication.

PISTONS

Cast iron has proved itself to be the best material for the manufacture of pistons, since the cylinder blocks are also made of cast iron.

For cylinder blocks and pistons have the same ratio of expansion and



A significant advance in engine design. This gun drilled passage lengthwise through the connecting rod carries a stream of oil, under pressure, to the piston pin bushing

contraction and it is therefore possible to fit the pistons sufficiently close to give the smoothest operation and maximum efficiency at all times.

The pistons employed in the Cadillac engine are of nickel-iron of special formula, of close grain and great durability.

Three piston rings are used, two above the piston pin and one below. The lowest ring is of the slotted type, in a drilled ring groove, enabling excess oil to drain back through the piston into the crankcase.

CRANKCASE

Strength, rigidity and stability, combined with light weight, are outstanding features of the crankcase. The material employed is a special copper alloy aluminum, with a strength-to-weight ratio more than twice that of an iron casting. A great deal of effort has been expended in developing a case which is not resonant. This, coupled with extreme rigidity in both the horizontal and vertical planes, gives freedom from rumbles and vibration. The walls of the crankcase are adequately reinforced by ribbing, and support the crankshaft and camshaft bearings.

CYLINDER BLOCKS

The Cadillac cylinders are cast en bloc, in fours, with detachable heads. Cylinders are set slightly staggered to permit use of side by side

connecting rods. Both inlet and exhaust valves are on the same side of the combustion chamber.

A gray cast-iron alloy, of Cadillac special formula, used in the cylinder blocks, gives them exceptional wearing qualities and facilitates the formation of a glass-like surface on the walls of the bore which is produced by honing.

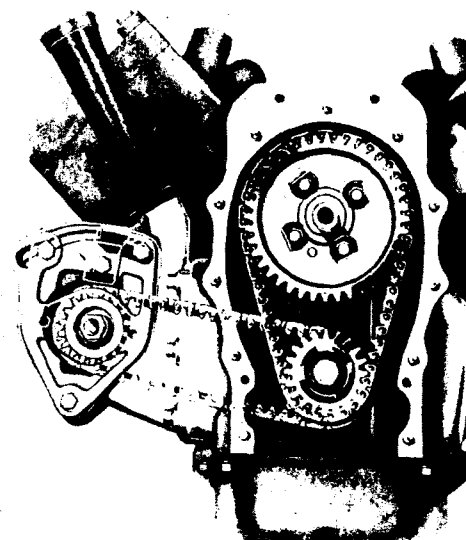
DETACHABLE HEADS

The cylinder blocks have detachable heads to facilitate servicing. Casting of the cylinder heads separately renders it possible in manufacturing to have access to both ends of the cylinder bore, permitting more accurate machining and inspection.

VALVE MECHANISM

The Cadillac eight-cylinder, V-type eight design permits a simple and unusually quiet valve mechanism. The single camshaft is a drop forging, supported on four bearings, has sixteen integral cams, each operating one of the sixteen valves. It is positioned directly above the crankshaft, and driven from it by a silent chain of unusual width and strength.

To convey a supply of lubricant to its bearings, the camshaft is hol-



To gain quietness, smoothness, flexibility, silent chains, instead of gears, drive the camshaft, generator and water pump

lowed through its entire length. Each valve is actuated by a cam slide carrying a hardened steel roller, which rides upon the cam.

The cam slides operate in bushings assembled to the crankcase in

groups of four. These bushings are very accurately machined and aligned, and have dimensions whose limits vary by no more than .0005 of an inch. The cam slides, which operate the valves, have easily manipulated adjustment screws.

The Cadillac poppet valves are forged from high quality special steel. Inlet valves are tungsten steel and exhaust valves are silico-chrome steel.

The clear diameter of the valve is approximately $1\frac{1}{2}$ inch. The valve stems have their bearings in guides $3\frac{1}{16}$ inches long, pressed into the cylinder blocks. This length reduces the wear. The valve lift is $\frac{3}{8}$ inch.

The exhaust valve seats are at an angle of 45 degrees. The inlet valve seats are at an angle of 30 degrees, in order to give freer passage to the gases when the valves are opened.

CHAIN MECHANISM

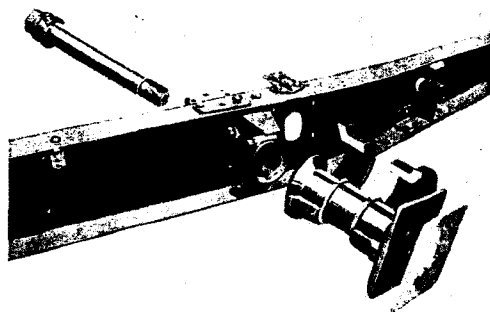
Silent timing chains are used. They have the advantage of being quieter than gears, and of retaining this quietness throughout their life.

A large sprocket is keyed directly to the camshaft and is driven from the crankshaft sprocket by a silent chain, while another silent chain, from a second crankshaft sprocket, drives the water pump and generator.

EXHAUST MANIFOLDS

The two cylinder blocks have separate exhaust manifolds, the front ends of which join a common manifold connected to a pipe passing down between the engine and the frame. The exhaust pipe is thus kept as far as possible from the floor boards, to insure a cool driving compartment in summer. A tail pipe from the muffler carries the exhaust gases to the extreme rear of the chassis, on the left side, making for unusually quiet operation.

The discharge of exhaust gases at the extreme left rear is advantageous also when occupants alight or enter from the right side.



This entirely new type of engine support provides a mounting fully cushioned in live rubber

ENGINE SUSPENSION

Cadillac employs three-point engine suspension. Improved rubber-lined mountings are used to support the engine at the two points at the rear of crankcase and a ball-and-socket joint at the front cover plate.

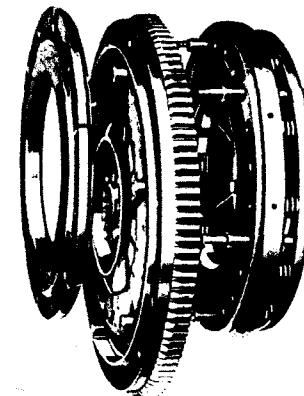
These rubber mountings act as a complete insulation of engine from frame, and any engine noises that might possibly develop cannot be transmitted to the interior of the car, thus preventing body rumbles.

The rubber is of great durability. By this development the engine is relieved of acting as a cross member for the frame.

Lower Transmission System

CLUTCH

The clutch is of the dry plate type with two driven discs, each $9\frac{1}{2}$ inches in diameter, faced on both sides with compressed asbestos fabric,



Two driven discs faced on both sides with compressed asbestos fabric make up the clutch

and driven by the flywheel. All springs, levers and other parts of the clutch, with the exception of the clutch thrust bearing, are attached to the flywheel. The clutch thrust bearing is carried on a sleeve attached to the transmission case. As a result of this construction there is a reduction in inertia of the spinning member of the clutch, and thus unusual ease of gear shifting is attained.

This design of clutch is built so that it will withstand, without need of frequent adjustment, all manner of stresses and strains to which this part of the transmission system is liable to be subjected.

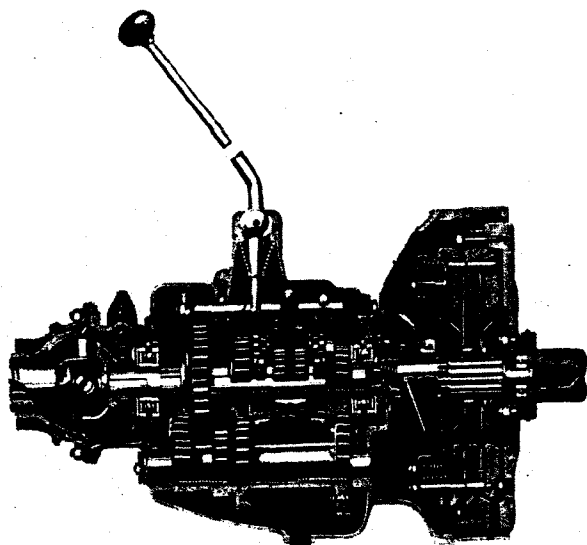
SYNCR0-MESH TRANSMISSION

The new Cadillac Syncro-Mesh silent shift transmission provides three speeds forward and one reverse. A most unique feature of this transmission is a device which enables a driver to shift gears at any speed without clashing.

When a change is made from low to second, second to high or from high to second, this device causes the two spinning members which are about to mesh to revolve at the same speed. Thus, shifting is effected without clashing.

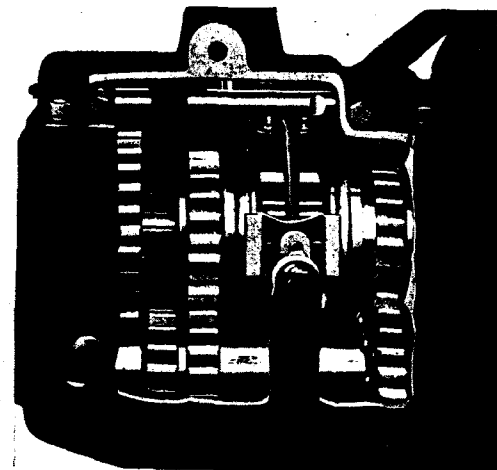
This synchronizing effect is brought about by a pair of simple cone clutches which are actuated by the transmission control lever through a cam mechanism. As the control lever leaves the neutral position and is moved toward second or high it engages one or the other of the cone clutches just long enough to synchronize the two members so that when the control lever is moved further, the teeth which interlock to take the drive are turning at the same rate of speed.

The operation of the Cadillac Syncro-Mesh transmission is, in general, the same as the operation of the conventional selective sliding gear type



Cadillac's newest contribution to luxurious motoring is this Syncro-Mesh transmission, newly designed upon a new principle. It permits quick, smooth, quiet shifts, however hurried the traffic line may be

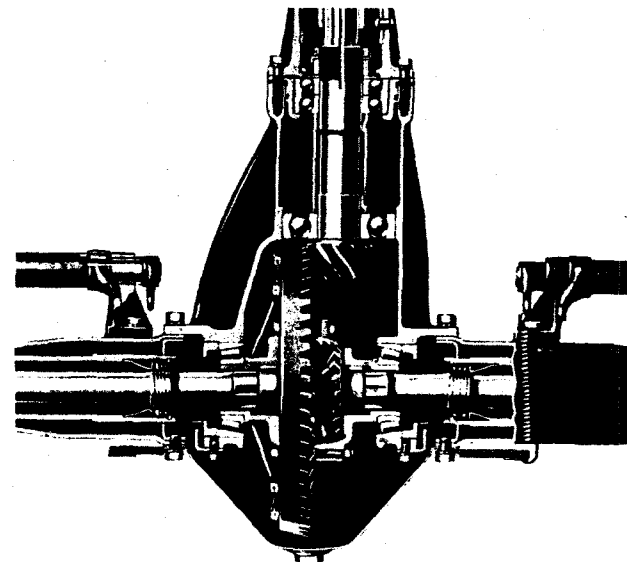
of transmission. The positions of the control lever for the various gear combinations are the same, and the directions in which the control lever is moved are the same.



The Syncro-Mesh transmission utilizes cone clutches to equalize the rotating speed of the gears just before the shift is completed

The only difference is in the manner of moving the control lever. With the conventional transmission it is necessary when shifting to a higher gear to hesitate momentarily in neutral, and then move the lever quickly to its new position; also when shifting to a lower gear to shift as rapidly as possible.

With the Cadillac Syncro-Mesh transmission there is no necessity when shifting to a higher gear either for the hesitation in neutral or for the



Silent, efficient, rear axle operation has long been a cardinal feature of Cadillac cars

rapid movement of the lever during the last part of the shift, or for the quick movement of the lever when shifting from high to second. The movement of the control lever should be one continuous movement and should be somewhat deliberate in order to give the synchronizing mechanism an opportunity to perform its function.

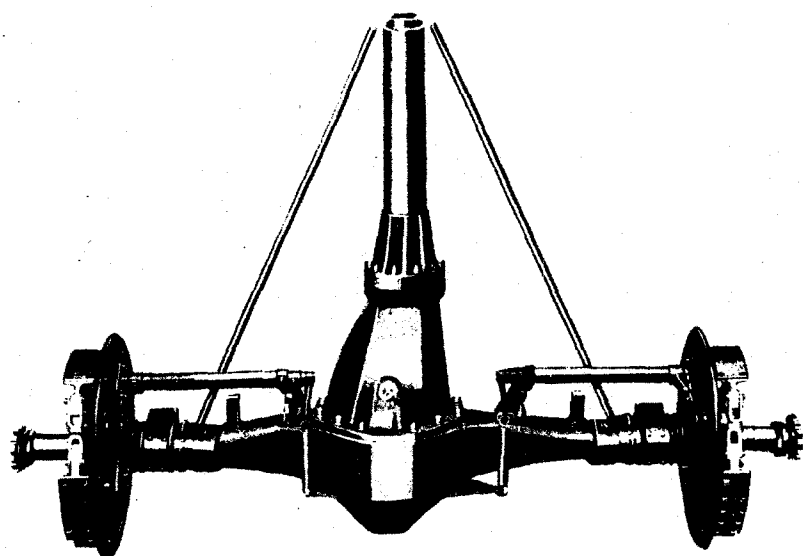
The gears and shafts of the Cadillac transmission are alloy steel, oil-hardened. The faces of the gear teeth are accurately ground. The gear faces distribute tooth pressure over an ample area to minimize wear.

The rear of the clutch connection shaft and the main transmission shaft revolve on roller bearings.

The front end of the clutch shaft is also carried in a roller bearing, housed in the rear end of the crankshaft. The countershaft gear cluster revolves on two roller bearings on a stationary shaft.

PROPELLER SHAFT

The propeller shaft, between the transmission and the rear axle, is a tubular steel shaft $2\frac{1}{2}$ inches in diameter, turning in a torque tube, which completely seals the entire assembly.



Driving impulse is imparted to the car through the torque tube which encloses the propeller shaft, leaving the rear springs free for the single function of supporting the body

The rear end of the propeller shaft is rigidly connected to the pinion shaft of the rear axle by a splined sleeve. The front end of the propeller

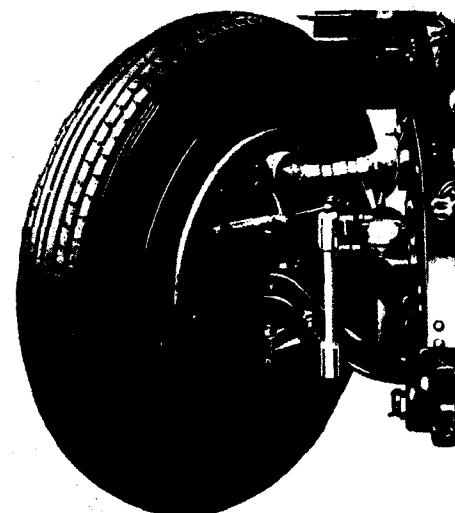
shaft is connected to the transmission shaft through a universal joint which is immediately behind the transmission case and is lubricated by the transmission lubricant.

TORQUE TUBE DRIVE

A torque tube surrounds the propeller shaft. A flange fastened to the rear end of this tube is bolted to the differential carrier and the front end is pivoted in a ball-and-socket joint at the rear of the transmission. This tube absorbs the torque reactions that accompany acceleration and application of the brakes. The torque tube entirely relieves the rear springs of all driving forces.

Duplex-Mechanical Four-wheel Braking System

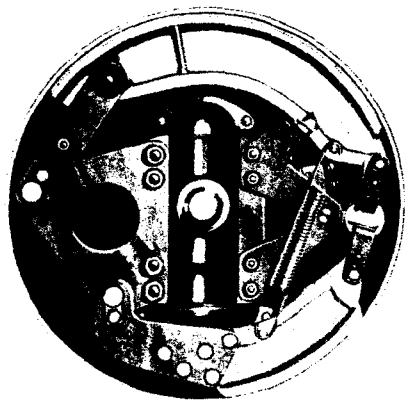
The Cadillac Duplex-Mechanical system of four-wheel brakes consists of three pairs of brakes of the internal shoe type. Two pairs of service brakes, operating by the brake pedal, act as a unit upon all four wheels simultaneously and in the proper ratio to assure maximum braking efficiency in any kind of weather or road surface condition. Another pair of brakes operating on the rear wheels, through the brake lever, provide



Cadillac's effortless, Duplex-Mechanical four-wheel brakes are a new, internal shoe type adapted to all the requirements of modern high speed motoring

full emergency or parking brake action. All of the brake drums have the same diameter— $16\frac{1}{2}$ inches.

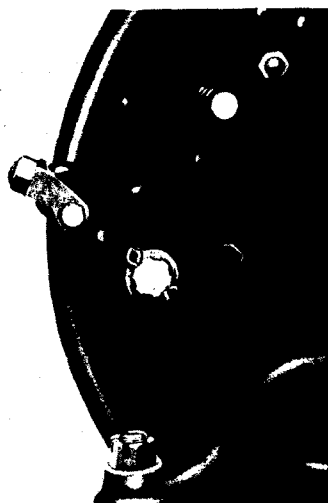
The parking brake and rear service brakes have separate and in-



Slight pedal pressure brings the full area of the brake lining instantly into use. The mechanism is enclosed away from mud, water and frost

dependently operated brake shoes, ingeniously arranged in the space usually occupied by one brake. Both front and rear brakes are operated by cams. All controls are so arranged that brake action remains entirely unaffected over the roughest road.

Apart from their remarkable efficiency, these new Cadillac designed brakes present decided advantages by being wholly enclosed within the drums, thus avoiding the usual troubles caused by mud, water, frost, etc.



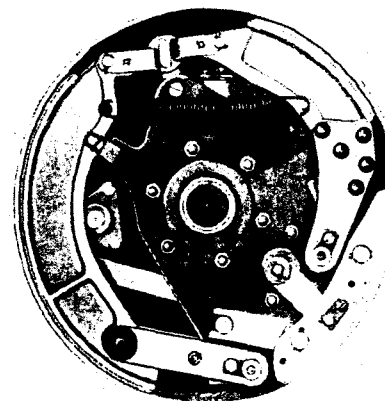
Adjustments need be made only at long intervals, and then are quickly and easily made through accessible nuts

Their ease of application and effective operation particularly appeals to the women drivers.

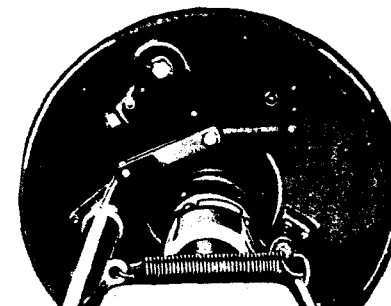
A specially designed application—a coil spring encircling each brake drum—aids in heat dissipation.

The brake lining gives unusually long life, since the cams which operate the shoes are not stationary, but are allowed to float in a spring-controlled arm, thus permitting them to center themselves and compensate for any unequal wear, so noticeable in other cam operated shoe brakes.

Brake adjustment is much more infrequent and has been reduced to a simple adjustment, easily accessible from the outside. The ease of brake operation is very greatly enhanced by the use of 16 sets of roller bearings throughout the system. This is an unusual refinement.



Service brakes and parking brake are wholly separate systems, but are ingeniously and compactly housed within a single rear wheel drum



Accessible nuts make it possible to adjust these brakes in a fraction of the time required in conventional systems

It is impossible to make the brakes "seize." Wrapping action either in forward or reverse motion is so uniformly distributed throughout the entire length of the brake shoes that "toe" or "heel" contact is unknown.

SAFETY FEATURES

Cadillac brakes are designed with the greatest consideration for safety. Provision for safety includes factors which give a combination only attained with Cadillac type mechanical four-wheel brakes.

One factor is a construction that provides for the partial or complete release of braking effort on the outer front wheel during a turn, so that it is impossible to lock both front wheels when turning, one wheel always continuing to rotate to facilitate steering.

Another safety feature, of course, is the provision of the emergency brakes, operating on an entirely separate and independent system.

OUTSTANDING ADVANTAGES

Briefly summarized, the outstanding advantages of the Cadillac Duplex-Mechanical four-wheel braking system are:

1. As a result of the remarkable design of this braking system, thousands of miles of the most severe test driving through the most mountainous regions of America have shown that efficiency of the braking effect has been very greatly increased over the average type of four-wheel brakes, yet considerably less strength is needed to operate them.
2. The brakes remain at their maximum efficiency during the life of the lining.
3. Being entirely enclosed, their efficiency is not affected by rainy or frosty weather conditions.
4. Seizure due to heat from continued use does not occur.
5. The position of the brake pedal and the braking ability are not affected by the heat generated by long mountain descents.
6. Brake lining has an unusual length of wear.
7. Adjustments are required much less frequently and, when necessary, are accomplished by a simple outside adjustment in a fraction of the time usually required.
8. There is absolutely no drag when the brakes are released.

Fuel System

A 21-gallon gasoline tank at the rear of the frame is provided. Feed is by vacuum to a smaller tank on the dash. A large sized tank filler projects outside the frame member, giving great accessibility, a vent pipe incorporated in the filler permitting the escape of air and thus preventing splashing when the tank is being filled.

VACUUM PUMP

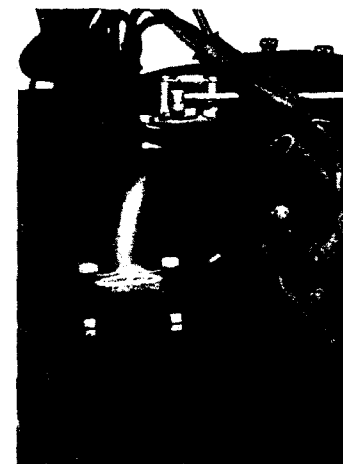
Unlike most vacuum systems, which depend solely upon the intake manifold vacuum, the flow of fuel to the carburetor is positive under all conditions, even when climbing the longest hills, or running at top speed for long distances. This is assured by a special vacuum pump, placed at the rear of the crankcase and driven by an eccentric on the camshaft. The pump, together with the intake manifold vacuum, provides the vacuum necessary to lift the gasoline to the vacuum tank, under all conditions, from which it flows to the carburetor. This arrangement is entirely unique and is protected by Cadillac patents.

FUEL STRAINER

The engine fuel is cleaned twice between the gasoline tank and the carburetor by two straining devices: Once, before reaching the vacuum tank, and, again, after leaving it. The second strainer is of the visible type, and cleans the fuel of water as well as dirt.

CARBURETOR

The Cadillac carburetor was designed to meet every requirement of the Cadillac eight-cylinder engine, and is manufactured in the Cadillac factory. It is of the air valve, single jet type, but with a number of exclusive



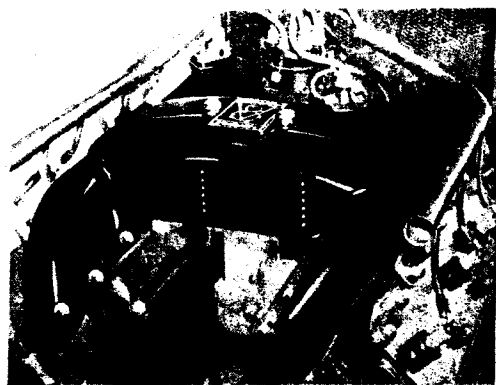
The flow of exhaust heat around the intake header is manually controlled from the instrument board

features. Located between the cylinder blocks, the Cadillac carburetor is but a short and equal distance from each of the eight intake passages; as a result, the passages are short and direct.

The auxiliary air supply, by which the correct mixture is automatically maintained at all speeds and throttle openings, is controlled by a leather-

seated swing valve, governed by an adjustable spring. Three thermostatic elements are embodied. One thermostatic device controls the action of the auxiliary air valve. The second thermostatic element regulates the action of the throttle pump to compensate for changes in temperature. A third thermostat, acting only at unusually high temperatures, opens a vent to permit the escape of gas pressure which might be generated in very hot weather by "high test" gasoline.

These thermostatic elements render unnecessary any seasonal adjustment of the carburetor.



A trim finishing touch to the engine assembly is this carburetor casing

Encasing the intake manifold is a specially constructed intake header cover which adds considerably to the appearance.

THROTTLE PLUNGER PUMP

The requirement for a mixture of additional richness at the moment of acceleration is met by a plunger pump, operated from the throttle shaft, forcing the necessary extra fuel through the spray nozzle.

EXHAUST-HEATED INTAKE

Complete vaporization of gasoline is provided for by an exhaust-heated intake manifold, fitted with a new manual control, regulating the amount of heat. This is operated by a lever on the instrument board.

The intake manifold is of the high turbulence type, insuring perfect distribution under all conditions.

The intake manifold is heated direct from the exhaust manifolds. By application of heat above and beyond the carburetor, that part of the mixture, which normally would condense and lodge on the walls of the intake manifold, remains a part of the explosive mixture which enters the cylinders.

The amount of heat supplied to the intake header is controlled by a

butterfly valve placed at the front end of the left-hand exhaust manifold. When this valve is closed the exhaust gases from the left-hand cylinders must pass through the intake header jacket to the right-hand exhaust manifold, thus giving maximum amount of heat necessary for carburetion. When the butterfly valve is opened after the motor has been running for a period of time, there is no continuous flow of exhaust gas through the intake header jacket. The amount of heat is then just enough to maintain good carburetion without power loss from overheating.

Thus the use of this valve control gives immediate application of heat at the vital point in the fuel system, resulting in remarkably good carburetion in a cold motor almost instantly the engine is started, the device being of great value in cold weather.

Ignition System

The Cadillac engine has a Delco-Remy ignition system of the high-tension type, a simple, high grade and reliable design embodying the following elements:

The source of current is the battery charged by a generator with automatic regulation of charging rate.

An ignition timer, which interrupts the low tension current at the proper instant to produce a spark high tension circuit. An induction coil transforms the primary current of six volts into one of sufficient voltage to jump between the points of the spark plugs. The coil is of the ironclad type and is completely enclosed, making it waterproof.

A condenser, which assists the induction coil to raise the voltage, and which protects the contact points of the ignition timer against burning.

A high tension distributor of the jump-gap type which directs the distribution of the high tension current to the spark plugs.

Structurally, the ignition timer, the high tension distributor, and the condenser constitute a single assembly which is bracketed to the front of the crankcase.

DOUBLE SET OF CONTACT POINTS

The ignition timer, which is driven by a vertical shaft through spiral gears from the camshaft, has two sets of contact points. These break alternately, sharing the work which would otherwise be done by one.

The firing order of the cylinders is as follows:

	8	7	5	2
Front	1	4	6	3

AUTOMATIC SPARK CONTROL

One of the many features embodied in the Cadillac is the further development of the automatic spark control.

The Cadillac automatic spark control is so effective that it has been possible to remove the spark control lever from the steering column and place it on the instrument board.

Cooling System

The temperature of the Cadillac engine is maintained at the point of maximum efficiency and smooth running by forced water circulation, with thermostatically controlled radiator shutters.

WATER PUMP

Circulation of water through the radiator and water jackets is maintained by a centrifugal pump, mounted on the right side of the engine, and driven by a silent chain from the crankshaft. The pump is coupled to the driven sprocket by a flexible coupling of laminated spring steel. This permits the pump shaft to align itself and run perfectly true in the packing.

THERMOSTATIC CONTROL

Thermostatic control of engine temperature was developed and first employed by Cadillac.

Vertical, balanced radiator shutters, controlled by a thermostat in the upper radiator tank, control the cooling water temperature.

When the engine is cold, the shutters are closed, cutting off the passage of air through the radiator. As soon as the temperature of the water reaches a predetermined point, the thermostat opens the shutters to the exact degree necessary to maintain the correct temperature.

The shutters not only control the temperature of the water, but also the temperature of the air under the hood, which assists carburetion and, with the use of the thermostatically controlled carburetor, greatly reduces the "warming up" period.

RADIATOR

The Cadillac radiator is outstandingly individual and possesses a distinction and impressiveness quite its own. It is of the cellular type core and the front is fitted with vertical shutters which automatically control the engine heat.

Beautifully proportioned along deep narrow lines, it has a sweeping, curved base instead of the more usual straight line. The radiator shell

in which the core is cased is chromium-plated, and the radiator cap of extremely wide diameter is built close to the shell.

Mounted low in the frame, this radiator accentuates the low slung lines of the car as a whole. A six-blade fan is driven at engine speed from the camshaft by a V-belt.

The fan hub carries a gear oil pump and oil reservoir for its own forced feed lubrication. It is necessary to add oil to the reservoir only every 1000 miles.

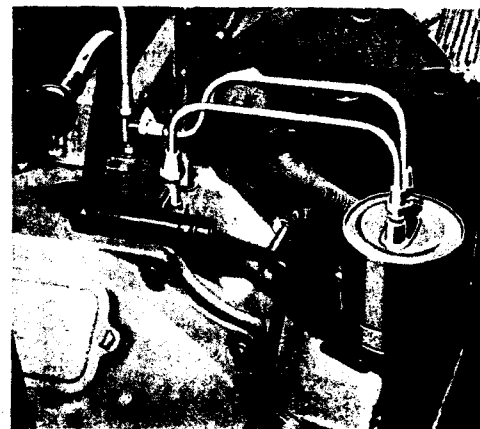
Lubrication System

The engine is lubricated by the pressure circulation system, employing a gear pump which is driven by an extension of the distributor shaft. The pump is attached to the cap on the front main bearing which it supplies through a direct passage.

The oil supply is carried in the pressed steel reservoir, of 8 quarts capacity, which closes the under side of the crankcase. A screen covers the entire area of the reservoir above the oil.

LEADS TO ALL BEARINGS

The oil is forced by the pump to a manifold fitting which runs the length of the crankcase above the oil pan, at the left. Leads connect this



To protect the finely machined engine surfaces, all grit and abrasives are removed from the engine oil

manifold to the center and rear main bearings, the rear camshaft bearing, the pressure gauge and filter.

OIL PASSAGES THROUGH CRANKSHAFT

Oil passages in the crankshaft conduct the oil from the main bearings to the connecting rod bearings. Oil forced from the connecting rod bearings is thrown by centrifugal force onto the cylinder walls and pistons, lubricating the cylinders. The wrist pins are lubricated by oil under pressure fed to them through oil holes drilled the entire length of the connecting rods. Oil is also led under pressure through the hollow camshaft, positively lubricating all camshaft bearings.

PRESSURE REGULATED

The pressure under which the oil is forced through the circulating system is controlled by a piston valve pressure regulator. Overflow from the regulating valve lubricates the chains and chain mechanism.

VALVE LUBRICATION

The exhaust valve stems are lubricated automatically by means of ports in the cylinder walls. All oil drains back into the reservoir.

An oil level gauge is provided on the top of the crankcase at the rear of the right cylinder block.

CRANKCASE VENTILATION

The Cadillac system of crankcase ventilation is unique and effective, preventing contamination of the crankcase oil with water and unburned fuel vapors. It is so effective that oil changes are necessary only after every 2000 miles.

An air port is provided in the left side of the crankcase. Due to the rotation of the crankshaft with its compensators, preheated air is drawn through this port and builds up in the crankcase a pressure slightly above atmospheric pressure.

In each cylinder wall a port is provided, which is uncovered as the piston passes upward. On the down stroke seepage vapors, which pass piston rings, are met by the pressure from below and forced through the port into the valve compartment. Conduits conduct the gases to the outside.

Starting and Lighting System

The Cadillac-Delco starting and lighting system was developed as a result of many years of effective cooperation between the Dayton Engineering Laboratories Company and Cadillac engineers.

The units of the starting system include a source of current supply—a

generator; a means of storing the current generated—a storage battery; and a method of applying the current to crank the engine—a starting motor.

SINGLE-WIRE SYSTEM

A single-wire system connects the different units, the circuit being completed through the frame. Connections from the chassis circuits to the body circuits are all made through accessible terminal blocks on the dash.

GENERATOR

The generator is driven at $1\frac{1}{6}$ engine speed by the crankshaft through the same silent chain as the water pump and is located on the right side of motor, directly back of the water pump. Current regulation is by an adjustable third brush, and an automatic thermostatic switch. The switch reduces the charging rate when the engine and generator warm up.

STARTING MOTOR

The starting motor, a Cadillac-Delco six-pole unit, is mounted horizontally at the right side of the transmission case. The starter pinion, which meshes with teeth on the outside of the flywheel, is controlled by the starter pedal. The starter has an exceptionally high stalling torque, capable of cranking the engine at any temperature.

STORAGE BATTERY

The specially built Cadillac-Exide storage battery gives uninterrupted service and long life. It is 130-ampere-hour, 3-cell, and 6-volt. The battery is carried in a dust shield compartment on the right side, and is accessible by removing a cover in the shield.

COINCIDENTAL IGNITION LOCK

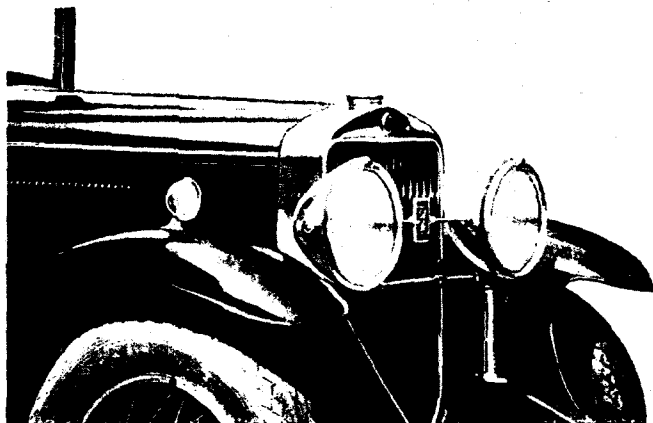
An ingenious ignition lock of the coincidental type is employed. This automatically locks the ignition and also transmission when the ignition is shut off, and thus makes the car theft-proof. This lock is located on the instrument board.

LIGHTING UNITS

Two large headlamps, twelve inches in diameter, of the bullet type, are used. These have a windsplit tapering from the front top of the lamp to the apex at the rear and this windsplit is duplicated also in the two parking lamps, carried on the front fenders.

The headlamps have double-filament bulbs, and highly efficient fluted diffusing lenses which deflect and spread out the rays. They are controlled by a switch at the center of the steering wheel. A single-wire system supplies current to the lamps, one side of each lamp socket being grounded.

The headlamps, parking lamps and tail lamp are controlled by a single lever at the center of the steering wheel. This operates a switch located at the bottom of the steering column. The instrument board lamps are controlled by a separate switch on the instrument board. The tail lamp is mounted on the left rear fender. The stop signal switch is operated



Parking lamps are smartly mounted forward on the front fenders and all lamps fully plated in chromium

from the foot brakes, the lamp being placed on the right rear fender. Protection is afforded to the various circuits by circuit breakers.

INSTRUMENT BOARD

The instrument board is finished in black Duco and is edged with nickeled moulding.

Upon this board the instruments are set in symmetrical order and are arranged in an individual assembly. They are not grouped together, a distinctive note being attained by this departure from present day practise.

Arranged on the board from left to right are windshield wiper control; switch for instrument board lighting, independent of switch on steering wheel; carburetor heat control; spark control; oil pressure gauge; button controlling carburetor-enriching device; speedometer; ammeter; electrically operated gasoline gauge; eight-day clock; coincidental ignition and transmission lock; motor temperature indicator; and combination inspection lamp and cigar lighter. In the center top of the board is a Cadillac medallion. Two small lamps illuminate the instrument board.

HORN

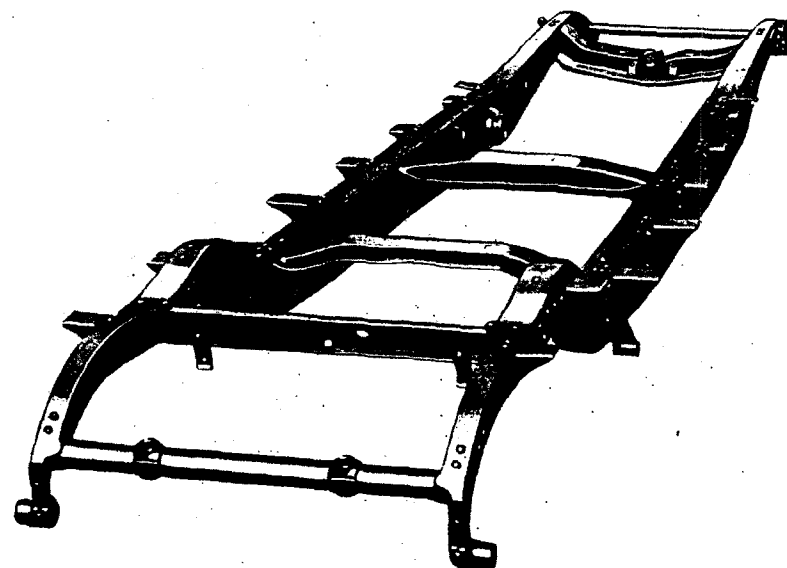
A high-frequency vibrator type horn of new design is located on the left side of radiator attached to the headlamp support. The terminals are neatly enclosed.

Chassis

FRAME

Strength and rigidity combined with lightness, with a resultant extremely wide margin of safety and very long life, are the bases upon which Cadillac engineers have designed the sturdier frame of the new Cadillac.

The side bars have a long, deep channel section through the center, where the stress is most severe, and an unusually wide top flange. The front sections of the side frame members are reinforced by steel plates. There is a gradual reduction in the section toward each end with "kick-ups" over both front and rear axles.



Exceptionally rigid construction here. The maximum depth of the frame is 8 inches, and both top and bottom flanges are abundantly wide to give great lateral stability

SIX CROSS-MEMBERS

The side bars are rigidly tied together by six cross-members; a central cross-member of channel section; a cross-member below the radiator which supports the radiator and the front end of the engine; a channel cross-member opposite the front ends of the rear springs; a channel cross-member at the rear of the body, supporting the gasoline tank; two tubular cross-members, one at the front and one at the rear outriggers.

REAR AXLE

The rear axle is of the full floating type with special alloy steel axle shafts, gears and housing tubes. The ring gear is mounted on large taper adjustable roller bearings. The pinion is mounted on large ball bearings, the thrust being taken by a double row ball bearing. Hub clutches are forged integrally to the ends of the axle drive shafts.

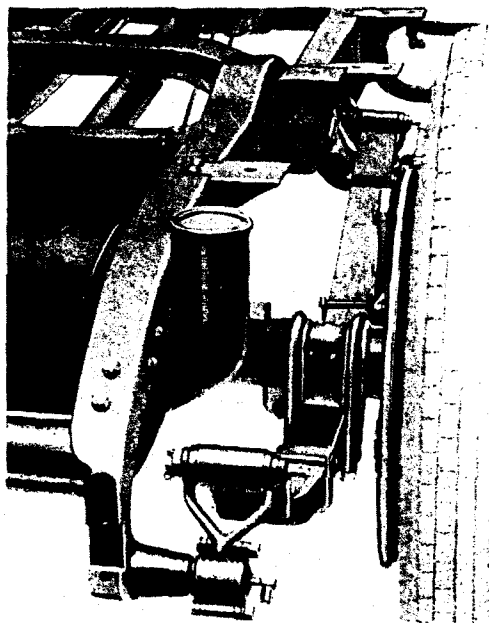
Fourteen driving teeth engage with similar teeth cut internally in the wheel hub. The drive shafts do nothing but transmit power from the differential to drive the rear wheels, all of the load due to weight being carried by the axle housing.

Each set of gears is lapped together at the factory. A large removable cover plate is located at the rear of the axle housing so that the gears and differential are easily accessible.

FRONT AXLE

The front axle is the reversed Elliott type. In it the angular relationship of the various parts has been so adjusted that greatly increased ease and security of control have been made possible.

The front wheels run on adjustable taper roller bearings, while the spindles pivot on the axle ends on adjustable roller thrust bearings. The parallel rod is straight and has self-adjusting ball-and-socket joints at the ends.

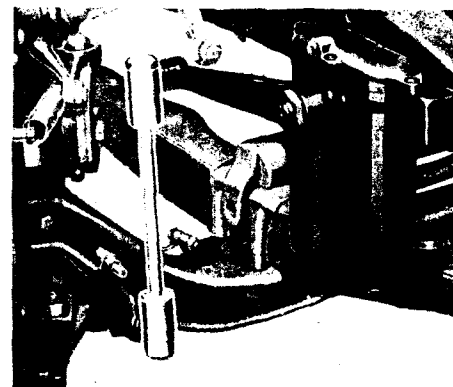


Rear springs are underslung from the axle and freely shackled at both ends. The ball-and-socket shackles absorb all twisting strains

SPRINGS

All springs are semi-elliptic, and are unusually long and flexible. The rear springs are underslung, thus giving a lower body level and a lower center of gravity. Large width of the springs gives great lateral support. Springs of different carrying capacity are used for various body models, so that maximum ease of riding may be secured in all cases.

The rear springs transmit no driving forces and are shackled at both ends. The shackles are of the tension type and are provided at each end with a ball-and-socket joint which relieves the frame and body, as well as the springs, of twisting strains when traveling over uneven roads. The



Hydraulic shock absorbers are of twin-barrel type, affording a dampening action on both upward and downward motions of the spring

rear shackle of the front spring is strong, yet thin and flexible, which adds materially to the riding qualities of the car. Spring leaves are silico-manganese steel, heat treated to give maximum life. New type hydraulic shock absorbers are fitted front and rear. These are of the double-action piston type, which gives a dampening action both up and down, and adds wonderfully to the remarkably easy riding quality which is one of the chief features of the new Cadillac.

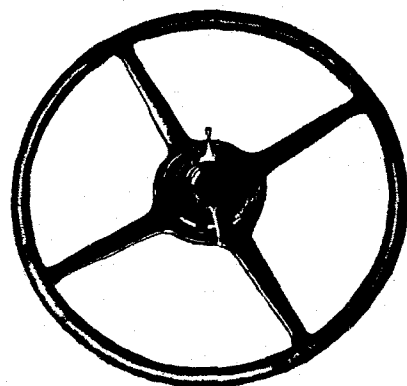
WHEELS

Three types of wheels are available—wood, wire or disc. Diameter of wheels is 20 inches. Wood wheels, which are standard equipment, have demountable rims of split type while the rims are integral with wire and disc wheels. There are twelve spokes of best selected hickory in each wheel. The felloe is of steel, with spokes anchored into place under hydraulic pressure. The wire wheels are designed to offer unusual lateral strength. Disc wheels have a double curve of such proportions as to insure resiliency and freedom from rumble. Disc wheels or wire wheels are obtainable at extra charge. Tire size is 7.00-20 (32 x 6.75, old designation).

STEERING GEAR

The steering gear is of the worm-and-sector type, providing a reduction of 15 to 1. The worm is supported in the gear housing by plain bearings taking the radial load, and adjustable ball bearings which take the thrust. The sector is machined from a single drop forging of nickel-steel.

The steering wheel rim is of a special design of rubber composition with steel reinforcement. It is 19 inches in diameter and the rim has four sections with a ribbed grip. The hub is of aluminum alloy with throttle control lever and lighting switch lever at the hub. The tubular steering connecting rod has a ball-and-socket joint at each end. The spindle arms, of generous dimensions, are forged of chrome-nickel steel.



The narrow rimmed wheel is built upon a strong core of solid steel

PART II
Cadillac Bodies

Cadillac Bodies

The new line of bodies created for the New Cadillac emphasizes, even more than ever before, the distinctive beauty, luxury, comfort, richness and last, but not least, the safety of Cadillac cars.

To the body styles that have already established such a dominant leadership in style, that have created today's vogue in motor car styles, have been added refining touches, still further comfort and luxury, even more exquisite treatments of color and finish.

Only a recognition by the Cadillac Motor Car Company of the fact that the public demands of Cadillac today not only superb performance, plus outstanding beauty, but also a car possessing a general indefinable air of being in a class of its own, could have made Cadillac designers rise to such heights as is so outstandingly evidenced in these wonderful examples of coachcraft.

NUMBER OF BODY STYLES

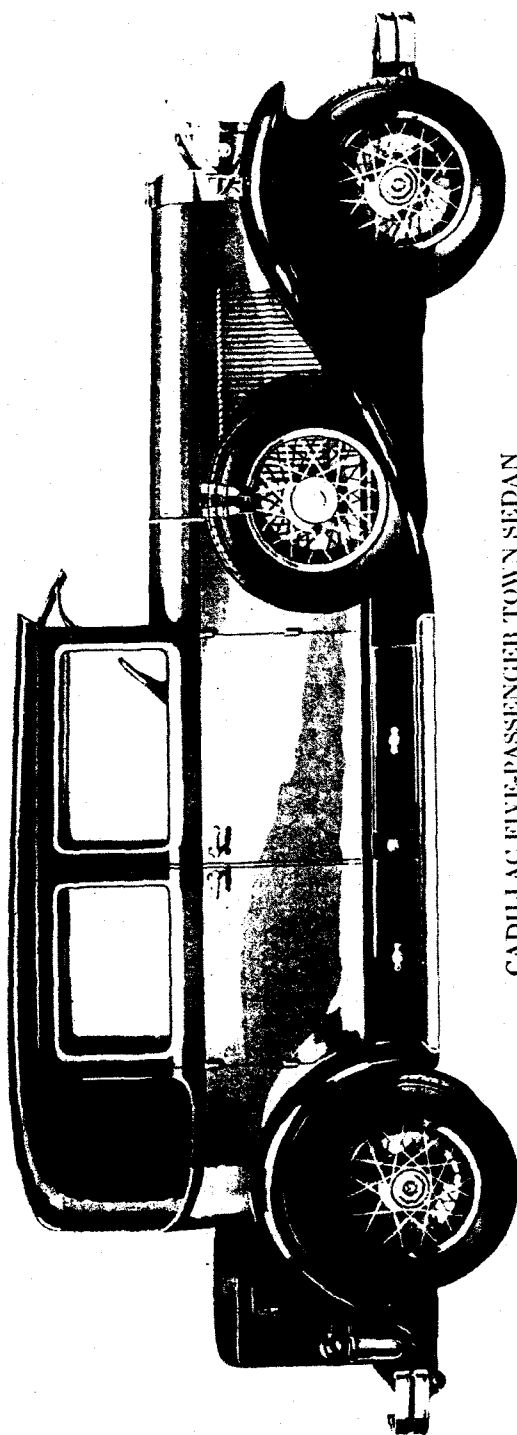
The New Cadillac line of bodies is offered in eleven Fisher custom bodies and thirteen special Fleetwood custom bodies. All bodies are on a 140-inch wheelbase chassis.

The eleven Fisher bodies are:

Two-passenger Roadster	Five-passenger Coupe
Seven-passenger Touring	Five-passenger Sedan
Four-passenger Phaeton	Five-passenger Town Sedan
Four-passenger Sport Phaeton	Seven-passenger Sedan
Two-passenger Coupe	Seven-passenger Imperial Sedan
Two-passenger Convertible Coupe	

The thirteen special Fleetwood bodies will comprise the following:

- Five-passenger Sedan, Style 3830-S
- Five-passenger Imperial, Style 3830
- Five-passenger Club Cabriolet, Style 3861-S
- Five-passenger Sedan Cabriolet, Style 3855-S
- Five-passenger Imperial Cabriolet, Style 3855
- Seven-passenger Sedan, Style 3875-S
- Seven-passenger Imperial, Style 3875
- Five-passenger All-Weather Phaeton, Style 3180
- Five-passenger All-Weather Phaeton, (Imperial), Style 3880
- Transformable Town Cabriolet, Style 3512
- Transformable Town Cabriolet, Style 3520
- Transformable Town Cabriolet, Style 3525
- Transformable Limousine Brougham, Style 3591



CADILLAC FIVE-PASSENGER TOWN SEDAN

A dashing representative of the entire line of Cadillac body types is this smart, close-coupled, four-door Sedan type. It is equipped with trunk and luxuriously appointed in accordance with the Cadillac conception of modern travel comfort.

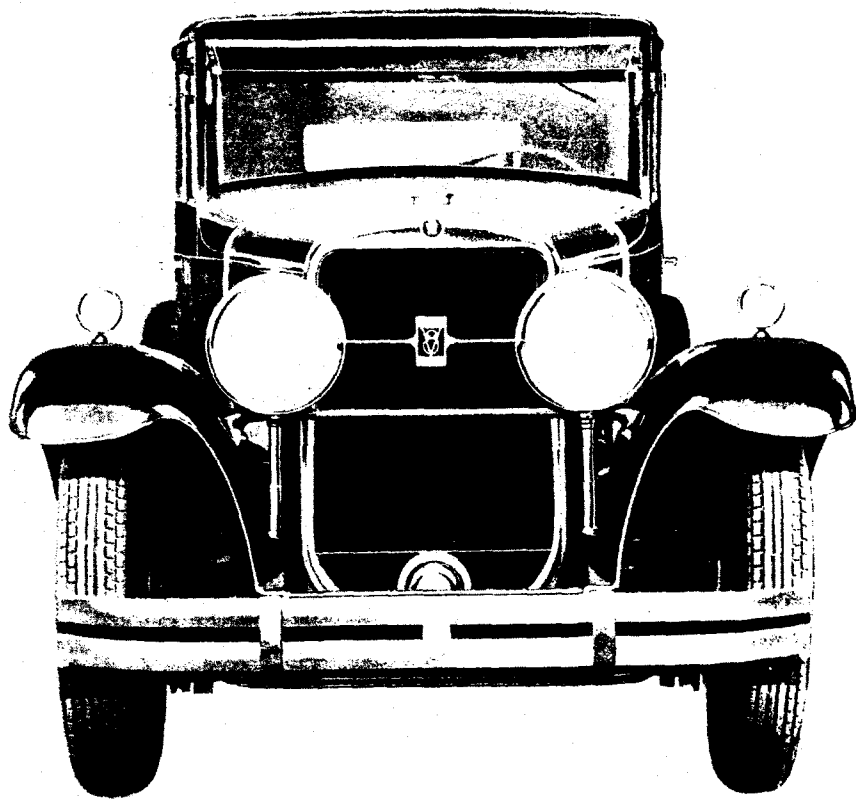
The Fisher Custom Body Line

From the handsome, distinctive radiator, deep slung in the chassis, creating a low, fleet and powerful appearance, to the distinctive, slat covered gasoline tank in the rear, these bodies reflect a departure from all commonplace body designs.

The radiator itself is of an entirely original design, deep, narrow, with its depth accentuated by vertical shutters which are operated thermostatically.

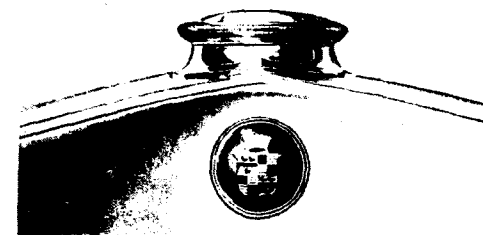
The base of the radiator is a beautiful curve, instead of the more usual straight line base, and a large crank cap is let into the lower portion of the radiator, lending a striking note.

Encased in a chromium-plated nicked shell, at the top front of which is carried a Cadillac medallion with a black background, the radiator is surmounted by a new type radiator filler cap built close to the shell, giving the effect of an extremely large filler opening.



Majestic with its imposing radiator, great headlamps, and distinctive monogram rod, the new Cadillac dominates the highway

The head-on appearance of the car is deeply impressive and dignified, with its two large headlamps of the bullet type, each 12 inches in diameter with a windsplit tapering to the apex. This windsplit is duplicated in the two bullet type parking lamps, which are mounted on the front fenders.



Silver-white chromium plating on the radiator shell displays the Cadillac crest to maximum advantage

The headlamps are carried on horizontal brackets, mounted on each fender, and headlamp wiring is concealed in two vertical chromium-plated lamp standards, connected by a horizontal monogram rod, which greatly enhance the car's appearance.

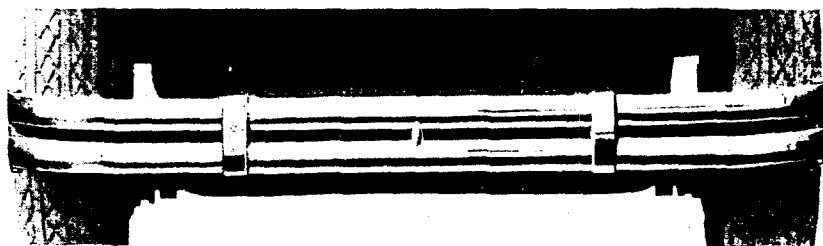
The long wheelbase and the low, sweeping lines of the hood with its thirty high and narrow louvres are indicative of great power, and the well proportioned balance of body and hood is an outstanding characteristic of the new car.

Horizontal moulding of a unique pattern, great width, and rounded section is carried along the sides of the car and offsets into the vertical



The slatted panel covering the gasoline tank is a smart touch of finished coachcraft

panel of the upper body paneling at the belt line. The cowl moulding on the closed cars on either side is a direct continuation of that on the hood and, at the junction of cowl and front body pillar, sweeps into a curve



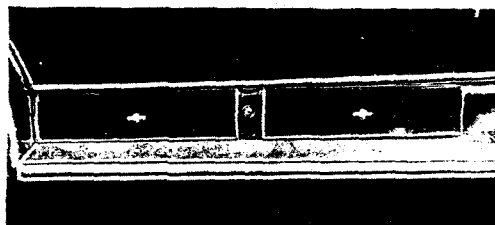
Bumpers are a broad bar type, fully plated in chromium

alongside the base of the windshield. It then runs back into the center hinge line of the hood, and thus forms a windsplit panel, adding a distinctive note to the cowl.

Wide, sweeping fenders of one-piece metal give fleet lines to the car as a whole and by their contour emphasize the low slung appearance of the car.

Running boards of rigid metal construction, covered with rubber matting, and a specially designed chromium-plated moulding of a rounded section, give the boards a smart finish. A new type of bumper, also chromium plated, is fitted front and rear, consisting of two bars of oval section.

The battery box is let into the front of the right-hand dust shield, the cover of which also forms a kick pad. Another kick pad is located in dust shield beneath the rear door, a step light being placed in between the



This front kick pad serves as a door for the battery compartment. It is fitted with a theft-proof lock

two kick pads. In the left side dust shield is a tool box, with combination cover and kick pad, and a second kick pad, beneath the rear door.

Two rear lights of unique design are used, one on each rear fender. The tail light is mounted on the left fender and the stop light on the right rear fender.

Great accessibility is provided for the gasoline tank filler which projects vertically outside the side frame member. The back view of the car is greatly enhanced by the unique finish of the gasoline tank which is fitted with a metal covering of corrugated slat effect. All bodies and hoods are finished in Duco.

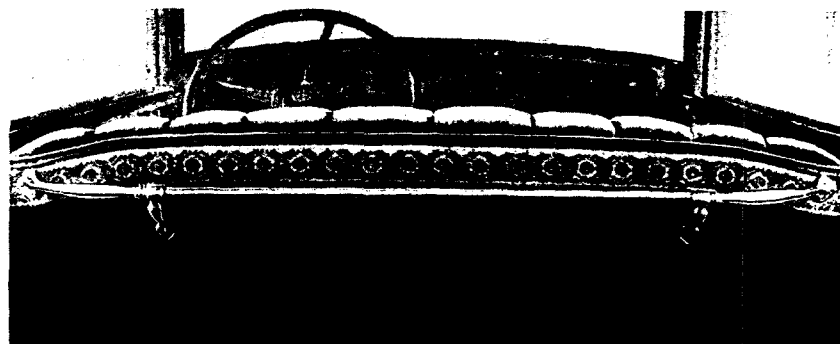
CONSTRUCTIONAL DETAILS

Craftsmanship, born of years of experience, is inbuilt in all Cadillac bodies. Only the Fisher Body Corporation, with its huge volume of business and wide facilities, could produce such expertly built bodies of such matchless quality.

The frames are built of choicest selected hardwoods, entirely free from knots, of perfect straight grain and is thoroughly kiln dried.

All body sills are of extremely solid construction.

Body brackets, braces, stays and bolts are employed wherever additional strength is needed, and thus great durability and freedom from warping are provided.



Robe rails are an exclusive design, pleasingly graceful, handsomely finished, and the front seat back is treated in broadlace

Heavy reinforcement is added to the dash, which results in great rigidity at a point which is subjected to severe strains.

Throughout the bodies particular care is taken to insure quietness in operation. All metal attached to the body is faced with a coating of anti-squeak material where metal and wood contact.

Doors incorporate a dovetail, of special construction, encased in metal, which eliminates wear and assures the permanent alignment of the doors. Large rubber door bumpers are used on all models. Windows have walnut garnish rails. Sills covered with German silver step plates and double safety striker plates for door locks of hardened steel, chromium-plated, are used. Inside door handles are of the remote control type. The door handles are offset hand grip type. The key lock in the right front door is operated by the same key that fits the ignition lock. Other doors are fitted with inside thumb lever locks. A separate key is furnished for other locks.

An important safety feature is the use of Security-Plate glass which eliminates the hazard of shattered glass through accident. This glass is $\frac{9}{16}$ of an inch thick, with mirror finish, and ground and polished upon all outer edges. Windows are weather and rattle-proof. The top or

header rail contains a concealed channel, lined with felt, which engages the glass when the window is closed.

All door and rear quarter windows are operated with mechanical window lifts by handles of neat design mounted upon substantial base plates.

A sun visor of opaque glass is mounted above the windshield.

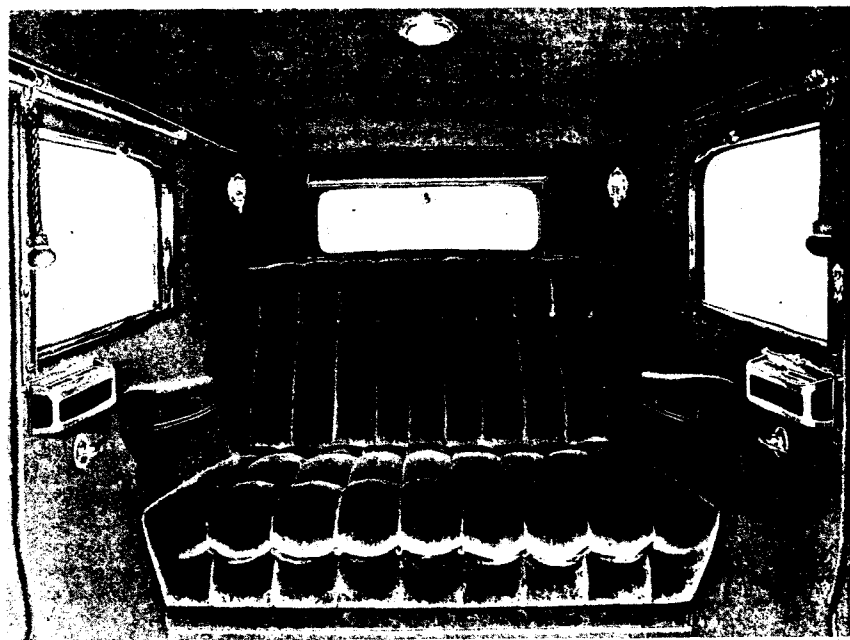
The roof on all models except the Convertible Coupe is constructed of two-inch slats, covered with padding and leather, waterproof fabric. Top quarter panels of sheet metal are added for strength and appearance.

Sides of roof are fitted with aluminum drip mouldings.

The windshield on all closed models, except the Convertible Coupe, is of the Fisher VV vertical type, operated by a regulator handle in the header bar. A slight lift of the glass opens a ventilating aperture across the entire width of the windshield behind the instrument board, or a full lift admits a stream of air directly into the body across the entire width of the windshield. The windshield is of Security-Plate glass in mirror finish with ground and polished outer edges, sliding in velvet covered channels. At the lower edge, it engages a soft, flexible rubber seat, forming a waterproof seal.

INTERIORS—UPHOLSTERY, TRIM AND APPOINTMENTS

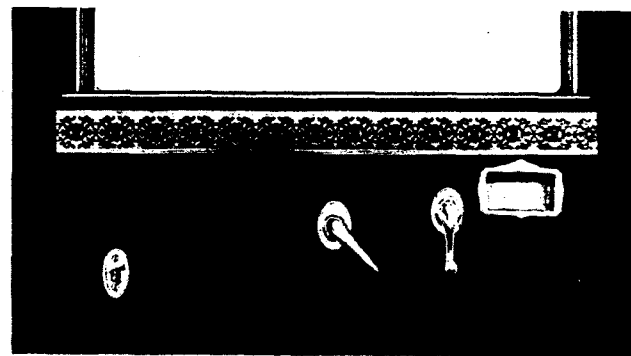
The interiors of the Fisher bodies are finished in a wide choice of plain mohair velvets of the finest quality. Broadcloth is optional. Seat cushions



A wide, deeply cushioned compartment in whose engineering the principles of pneumatic control have been scrupulously observed with refreshing results in quietness and comfort

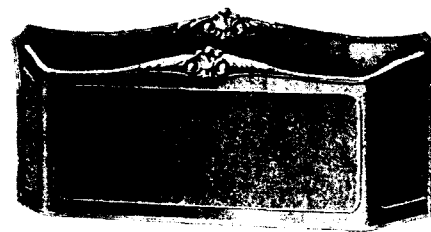
in closed bodies are tufted and plaited over special form fitting, luxury type springs that are the last word in comfort. A special design wool pad is used on top of the springs, which gives the effect and comfort of a soft down pillow. Open models are upholstered in soft, pliable leather.

Below the window garnish mouldings, and at the front seat back, is a distinctive trim of broadlace.



Panels of rich broadlace on the doors and across the back of the front seat add an aristocratic charm to car interiors. On certain models, ash trays of new type are inset into the door panel

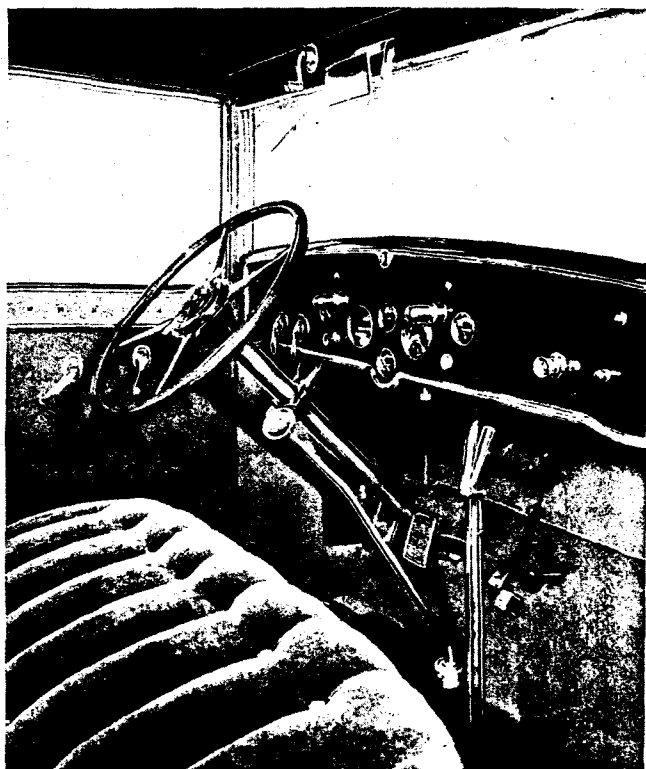
Hardware of exquisite design in oxidized silver finish, with oval escutcheon plates inset with Catalin stone, is in keeping with the exacting taste shown in the whole of the interior fitting. Such hardware as operating controls is finished in bright nickel plate. Vanity cases, cigarette ash receptacles, foot rests, robe rails and assist cords are included where required. The gear shift lever knob is of Catalin stone which adds a refined note to the control assembly.



Vanity cases are finished with dignified restraint. Inset panels are of mohair to match upholstery

The instrument board, with instruments arranged in individualized assembly, is finished in black Duco with a narrow, nickeled moulding. This arrangement of instruments, departing from the more commonplace grouped assembly, lends a distinctive air to the driving compartment.

The steering wheel is a new type of rubber composition. It is 19 inches in diameter and of a narrow cross section with ribbed grip, which makes for easy handling, and at the same time lends a distinctive note to the interior. In the hub are set controls for lighting, parking and throttle.



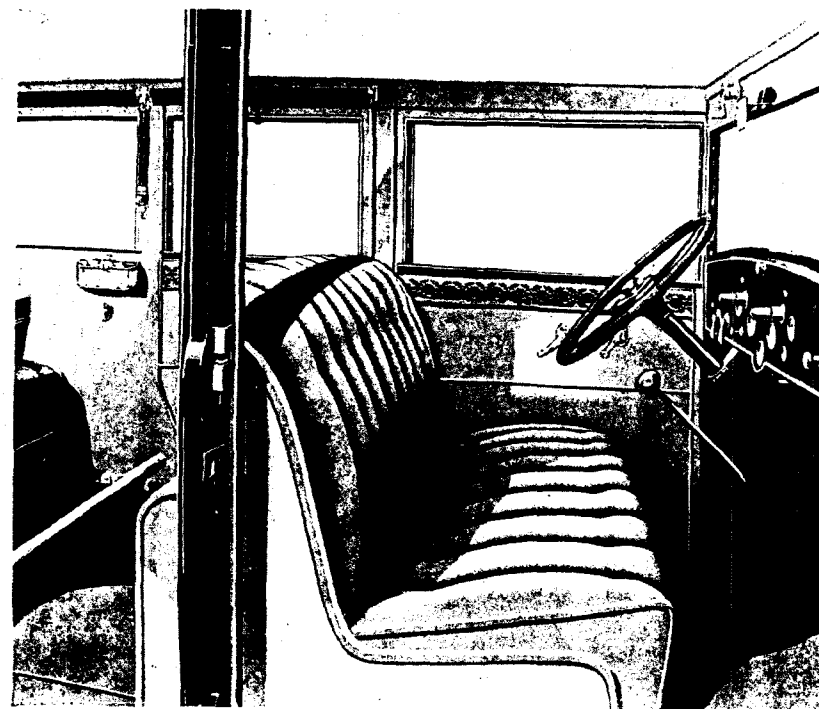
Security-Plate glass in the windshield and all windows is a highly valuable safety feature. It will not fly into fragments if broken. All driving controls are brightly nickel-plated, and instruments are distributed across the full width of the panel for easy reading.

An unusual feature and a refinement exemplary of the thoroughness of Cadillac design is the adjustable driving seat on all closed models.

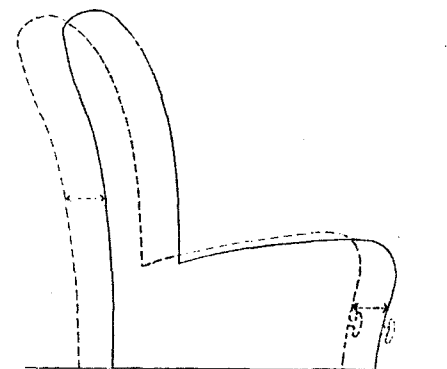
This feature enables the whole seat to be moved forward or backward as a unit by means of an adjusting handle, placed in the center of the seat base. A movement of two inches forward and one and one-half inches backward from normal for the average person is obtainable.

Thus the driving seat may be adjusted for the greatest driving comfort, a feature especially appreciated by women drivers and one that will eliminate strain and stretching.

In the Five-passenger Coupe, the adjustable handle is located on the right side of the seat, since the front passenger seat is of the "tip-up" type.



Each driver enjoys perfect comfort at the wheel, the front seat moving quickly and easily to exactly the position which best suits his stature.



Turning the accessible, easy-action control moves the entire front seat forward or backward through a range of 3½ inches.

Imperial type models, of course, having a glass partition between the driving and rear compartments do not have this adjustable feature.

In all open cars the driving seat, not the whole seat, is adjustable by means of a small handle placed on the top of the seat back.

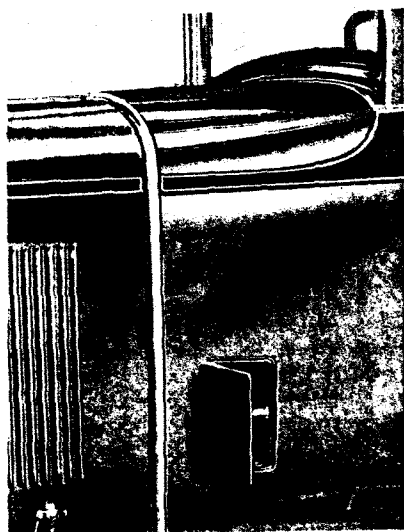
Folding arm rests are used in the center of the rear seats on all cars,



Arm rests are of new type with a convenient recessed nook for small parcels

open and closed, a feature giving comfort appreciated by rear seat passengers on long journeys. Carrying pockets of new design are pleasingly fashioned one under each side arm rest of the rear seat in closed cars. These pockets, apart from their utility, lend a striking note of originality to the car interior.

Floor coverings on all closed types are of fine quality carpet, and carpet is also used on the dash.



Ventilators, fully weather-stripped and controlled by short foot levers, supplement the action of the Fisher VV windshield by admitting fresh air just above the floor boards

On all closed models interior lights are controlled by an automatic switch in the door and also by an individual switch in the rear door pillar. The step lights are also operated by this automatic door switch.

Ventilators set in the side of the cowl for regulation of temperature in the driving compartment are fitted to closed models.

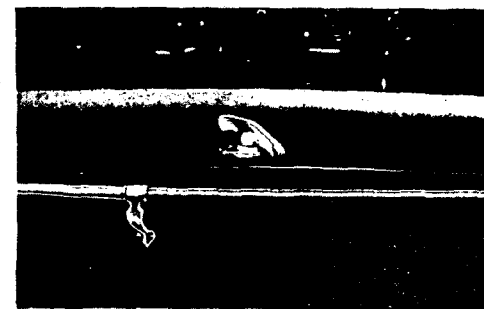
A new type electric windshield wiper of the double blade type is fitted on all models. This wiper is controlled by a separate switch on the instrument board.

An adjustable rear view mirror is mounted above the windshield.

Where wheels are carried forward in sunken fender wells, a new type folding trunk rack is mounted at the rear.

INDIVIDUAL FEATURES OF OPEN CARS

In the open models the beauty of the low, long lines is utilized to fullest advantage. Striping and moulding add to the dashing and modernistic effect and to the impression of raciness, power and speed.



The simple mechanism that permits instant adjustment of the driver's seat in open cars

The Fisher custom body open cars consist of the Two-passenger Roadster, Four-passenger Phaeton, Four-passenger Sport Phaeton and Seven-passenger Touring.

The moulding on these cars is distinctly original. Running horizontally along the top of the bodies this moulding, which is of unusual depth, makes a beautiful upward curve to the base of the windshield.

A chromium-plated windsplit panel is formed in the center of the top of the cowl by moulding, commencing from the hood hinge line and sweeping on either side into the base of the windshield.

All open cars have one-piece folding type windshields.

The tops are of wood bow construction with chromium-plated slat irons. Tops and side curtains are of gray double texture material of substantial quality. Top holders are of clamp type, chromium-plated.

Two cowl ventilators are used on either side of the top of the cowl. These provide a very large ventilating area.

Interior hardware is of beautiful design with white nickel finish, while outside door handles are of new bar type in chromium-plated nickel finish.

Hand buffed leather of a soft, pliable texture and satin finish is used for upholstery in colors harmonizing with the Duco body finishes.

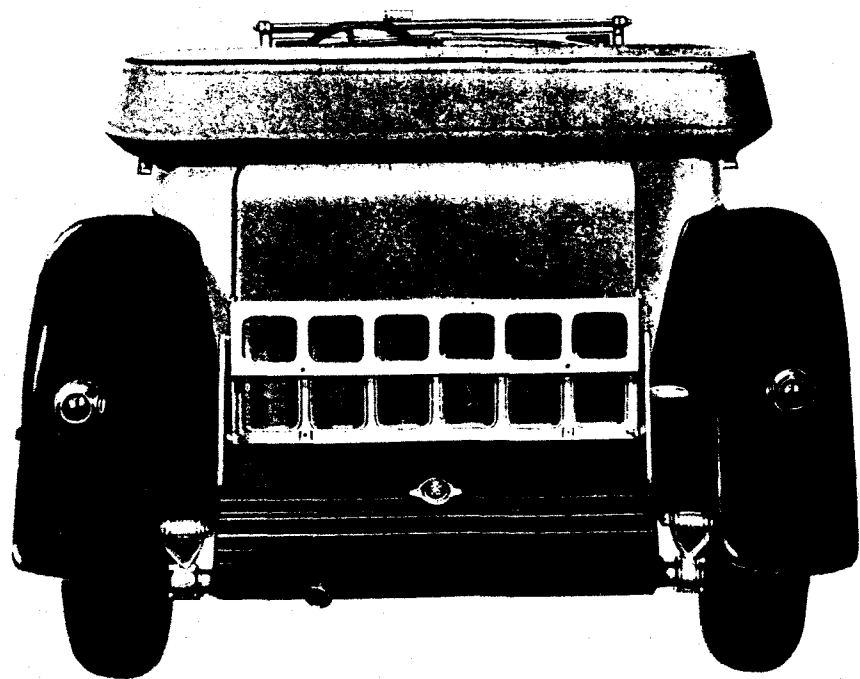
Automatic electric windshield wiper, front and rear chromium-plated bumpers, an adjustable rear view mirror and top boot are standard equipment on open bodies.

Some of the outstanding features of individual models are:

The Roadster has in the rear deck an unusually large and comfortable rumble seat, and attractive chromium-plated bars are fitted on the rear deck, upon which the top rests when folded. An inset door, on the right side of the rear deck, gives easy access to a large baggage compartment. A detachable back curtain is a feature of this top.

A leather, fabric covered trunk, fitted on a trunk rack, is a feature of the Phaeton and Sport Phaeton. The Phaeton has a built-in foot rail and robe rail with assist handles.

The outstanding feature of the Sport Phaeton is the tonneau cowl, giving closed car protection in an open car. This cowl is fitted with a folding type one-piece Security-Plate glass windshield. Another standard fitment is a large sized spot light, mounted on a tall vertical chromium-



Wide, close to the road, smartly equipped, the Phaeton reflects the most vigorous of the modern trends

plated post, which is bolted to the running board and supported by a wishbone bracket to the side of the cowl.

INDIVIDUAL FEATURES OF CLOSED CARS

The Fisher custom body enclosed models are the Two-passenger Coupe; Two-passenger Convertible Coupe; Five-passenger Coupe; Five-passenger Sedan; Five-passenger Town Sedan; Seven-passenger Sedan, and Seven-passenger Imperial.

Certain individual features are noticeable in several of these body types:

The Two-passenger Convertible Coupe may be used at will either as a closed or open car. The top folds back, the doors are rigid and the windshield is of the one-piece hinged type, swinging outward from the bottom, for ventilation. Edges of the windshield have a chromium-plated moulding. With the rumble seat in the rear deck in use, the car thus provides seating for four persons. An inset door, on the right of the rear deck, gives easy access for loading golf clubs and hand baggage into the rear compartment.

Attractive chromium-plated bars are fitted to the rear deck. Access to the rumble seat is provided by a step on the right rear fender.

A cigarette ash receptacle is let into the right-hand front door for passenger convenience. This feature is also found in the Two-passenger Coupe.

In the Two-passenger Coupe the rear window lowers flush with the sill by means of an accessible regulator.

The Five-passenger Coupe has a front passenger seat of the folding type, thus enabling easy access and exit of the rear seat passengers. In the rear deck is an unusually large luggage compartment.

The Town Sedan is a close-coupled car suiting the requirements of those demanding a more than usually companionable atmosphere for front and rear seat passengers. Ample leg room is provided for rear seat passengers by a "cut-out" under the rear of the front seat. A trunk is provided as standard, at the rear. Ash tray receivers are inserted in the rear quarter panels.

In the Seven-passenger Sedan, two folding auxiliary seats facing forward are provided, each giving an extraordinarily comfortable seat for one passenger. When not in use, these seats fold forward against the back of the front seat.

The Seven-passenger Imperial has a disappearing Security-Plate glass partition between the driving and rear seating compartments, and two auxiliary folding seats facing forward.

Wire or disc wheels with spare carried at the rear or mounted in front fender wells, and tire mirrors are obtainable on all body styles at extra charge.

Fleetwood Special Custom Bodies

Since the complete line of Fleetwood special custom bodies is fully described and illustrated in a separate catalog obtainable from Cadillac dealers, no attempt will be made in this book other than to describe briefly a few of the most salient features of these Fleetwood bodies.

The Fleetwood line of custom bodies has been created by the Cadillac Motor Car Company to satisfy the steadily increasing demand for still greater individuality and exclusiveness.

So wide and varied is the choice of bodies offered, that anyone requiring a custom built body expressing his individuality and exclusive preference can find in the line a car satisfying his own personal requirements.

Moreover, he can obtain quick delivery instead of having to wait a long period of time before his order receives attention, as is usually the case when a custom built car is ordered.

In the Fleetwood line are included Town Cars of the transformable and collapsible types which are the ultimate in aristocratic elegance and distinction, and also the All-Weather Touring body styles, the last word in modern coachcraft development.

The frames of these special Fleetwoods are of specially selected ash, and are constructed in the best manner known to the body building art. Door hinges are hand finished cast bronze.

Doors are equipped with specially constructed window channels of a type totally preventing window rattle.

Wiese broadcloth in subdued colors and special Venetian mohair is used throughout the whole line for the upholstery, a material expressing restraint and good taste. This material is of the highest quality.

In the Imperial and Town Car types, genuine hand-buffed leather is used in the driving compartment, harmonizing with the color tones of the car.

Cushions are stuffed with best quality hair. Hardware is of special exclusive Fleetwood design with nickel finish.

Interior mouldings are of mahogany or walnut to match vanity cases. The vanity cases are of Fleetwood design and include eight-day clock, hand mirror, memorandum pad and two ash receivers. Smoking sets contain a cigar lighter and an ash receiver.

TRANSFORMABLE BODY TYPES

The transformable type of body included in the Fleetwood line has this exclusive feature—the front driving compartment may be made open or closed at will.

Windows concealed in the front door panels may be raised, a removable top erected and the driving compartment becomes completely enclosed.

Extension stanchions of steel are erected from the front pillars to the body and the shape and line of the roof are preserved.

The extension roof cover is of genuine English hand-buffed double-faced landau leather. The roof and stanchions when removed are stored under the driver's seat, so that they are always available and can be attached within a few moments.

ALL-WEATHER PHAETON BODY TYPES

These new Fleetwood creations are the latest development in modern coachcraft and have enjoyed a particular vogue in European countries. The bodies have a great appeal to the motorist who is a lover of the open air and who desires a car that can be used as an open touring car, a semi-open car or a completely closed car.

Their unusual adaptability will attract the person who wishes to enjoy motoring in its widest embrace no matter what the season or climate is.

The entire top is of Burbank material and is entirely collapsible, all side windows may be raised or lowered, and in the Imperial type, Style 3380, the glass partition may be raised and used as a tonneau windshield when the top is down.

Whether used as an open car or completely closed car, these body styles possess a rare appeal in their extremely distinctive lines.

o-o

The Cadillac Motor Car Company reserves the right to make changes in specifications of any model at any time without incurring obligation to install same on cars previously sold

CADILLAC

CONDENSED SPECIFICATIONS

(Changes and improvements made are indicated by italics)

POWER PLANT

ENGINE—Compensated eight-cylinder V-type. Ninety-degree angle between cylinder blocks. Engine and transmission in unit; *three-point suspension with improved rubber lined supports at rear.* Piston displacement 311 cubic inches. Bore $3\frac{1}{8}$ ". Stroke $4\frac{1}{8}$ ". Horsepower S. A. E. rating 35.1; *actually more than 95.* Standard high compression 5.3:1. Optional low 4.8:1.

CYLINDERS—Cast in blocks of four, with detachable heads.

PISTONS—Cast gray iron, special formula, annealed; 3 rings, 2 above wrist pin and 1 below; lower ring special oil regulating type.

CONNECTING RODS—Drop-forged special formula steel. Side by side, two on each crank pin. *Rods are gun drilled for pressure lubrication of wrist pins.* Bearings $2\frac{3}{8}$ " x $1\frac{3}{8}$ ". Babbitt in rods at lower ends.

VALVES—Intake $1\frac{1}{2}$ " clear, tungsten steel; exhaust $1\frac{1}{2}$ " silico-chrome steel, $\frac{3}{4}$ " lift. Mechanism enclosed. Exhaust valve stems automatically lubricated.

CRANKCASE—Copper aluminum alloy.

CRANKSHAFT—Diameter $2\frac{3}{8}$ "; length to outer ends of front and rear bearings $23\frac{3}{4}$ ". Supported on 3 main bearings. Crank throws 90 degrees apart, provided with compensators. Rotates with unprecedented smoothness.

CAMSHAFT—Single, hollow shaft with 16 cams, supported on 4 bearings. Driven from crankshaft by silent chain.

CLUTCH—Disc dry plate type. Two driven discs $9\frac{1}{2}$ " in diameter, faced both sides with compressed asbestos fabric, driven by flywheel to which are attached all springs, levers and other parts of clutch, with exception of clutch thrust bearing, which is carried on a sleeve bolted to the transmission case.

TRANSMISSION—*Special Cadillac Sycro-Mesh transmission, giving noiseless,*

smooth gear shifting at all speeds. Selective type with three speeds forward and one reverse. Chrome-nickel steel gears and shafts. Faces of gear teeth ground on special grinding machine to obtain silent operation. Mechanism contained in cast-iron case.

GASOLINE SYSTEM

SUPPLY—Twenty-one gallon tank capacity. Vacuum feed. Vacuum from intake manifold assisted by vacuum created by a special vacuum pump to insure positive feed under all conditions.

CARBURETOR—Cadillac design and manufacture. Uniform distribution, with maximum efficiency and economy. Automatic thermostatic mixture control. Large accessible strainer. Overflow from carburetor drained to ground. Intake header exhaust heated. Valve in left exhaust manifold operated from instrument board, when closed, deflects exhaust gases back from left cylinders through intake header jacket to the right exhaust manifold, thus giving maximum heat for carburetor almost immediately after starting.

COOLING SYSTEM

RADIATOR—Copper with cellular core. *Casing chromium-plated on polished nickel.*

WATER COOLING—Capacity 6 gallons. Forced circulation by one pump driven by a silent chain from the crankshaft. Cylinder blocks inter-connected by a brass tube cast in crankcase. One drain plug for entire system; 3 hose couplings, easily disconnected.

TEMPERATURE CONTROL—Thermostatically controlled by radiator shutter with vertical balanced shutter blades.

FAN—Diameter $20\frac{1}{4}$ "; 6 blades; belt driven by pulley mounted on end of camshaft. Fan bearing positively lubricated.

LUBRICATING SYSTEM

ENGINE LUBRICATION—Pressure system with gear pump conveys oil under pressure to all main bearings, connecting rod bearings, wrist pins and camshaft bearings, and is controlled by an automatic pressure regulator. Oil level indicator is located on right-hand side of crankcase at rear.

CRANKCASE VENTILATION—An exclusive Cadillac system which prevents dilution of lubricating oil from unburned gasoline and from condensation of water vapors produced in combustion.

OIL FILTER—An effective filtering device which removes any impurities, in solid form from oil.

ELECTRICAL SYSTEM

IGNITION—Cadillac-Delco high-tension system with 2 timer contact arms actuated by 4-lobed cam. Jump-spark distributor, thus eliminating rotor button.

IGNITION LOCK—*Coincidental theft-proof ignition and transmission lock operated from instrument board.*

GENERATOR—2-pole Cadillac-Delco type, mounted on right side of engine. Positive drive by chain from crankshaft. Thermostatic control of charging current.

STARTING MOTOR—Cadillac-Delco separate 6-pole unit; special design, exclusive on Cadillac cars, and has unusual stalling torque. Mounted along right side of transmission.

BATTERY—Cadillac Exide 130-ampere-hour, 6-volt, 3-cell. Enclosed in moulded box located in right-hand dust shield.

HORN—*High-frequency vibrator horn of exceptional tone* carried on left headlamp bracket at side of radiator. Concealed connections.

LIGHTING EQUIPMENT—2 headlamps with tiltable light beams controlled from steering wheel; fluted lenses, 21 c.p. double-filament bulbs and parking lamps with 3 c.p. bulbs. *Parking lamps mounted on top of front fenders.* Two rear lamps, one located on each of rear fenders, right side is stop light, left side tail light. Step lights in dust

shields which light automatically with opening of doors.

WINDSHIELD—*Electric windshield wiper, tandem blade, operated by separate switch on instrument board.*

OPERATING CONTROLS

GEAR SHIFT—Center gear shift.

SERVICE BRAKES—*Duplex-Mechanical brakes. Two independent braking systems. Special new design. Entirely enclosed, giving maximum efficiency in all weather. Mechanically operated, internal on both front and rear wheels. Division of pedal pull automatically proportioned between front and rear systems. Front brakes equalized when straight ahead, outer brake released on turn. All brakes are $16\frac{1}{2}$ " in diameter.*

HAND BRAKES—*Internal, on rear wheels, and will not require adjustment during life of brake lining.*

STEERING GEAR—Cadillac design, worm and sector, completely adjustable. Reduction 15 to 1. Steering wheel 19" diameter, rubber composition, narrow rim with black finish aluminum die cast hub and spokes.

ENGINE CONTROLS—Accelerator at right of brake pedal. Hand throttle built into central portion of steering wheel.

INSTRUMENT BOARD—Instruments arranged in individual assembly—not grouped. *Fitted with electric windshield wiper switch; carburetor heat control; spark control; oil pressure gauge; button controlling carburetor enriching device; switch for instrument board lighting independent of switch on steering column; speedometer; ammeter; electrically operated gasoline gauge; eight-day clock; coincidental transmission and ignition lock; engine temperature indicator and combination inspection lamp and cigar lighter.*

AXLES—Rear axle, Cadillac make, full floating with special alloy steel axle shafts, gears and housing tubes. Spiral bevel gears mounted on large bearings. Front axle, reversed Elliott type, drop-forged steering spindles and arms; steering spindles have adjustable tapered roller bearings at upper ends. Parallel rod has spring compensated ball-and-socket connections at end.

DRIVE—Hollow steel drive shaft $2\frac{1}{2}$ " diameter in center, tapering to $2\frac{1}{8}$ " at each end, turns in torque tube, which completely seals assembly. Rear end of drive shaft rigidly connected to rear axle by splined sleeve; front end to transmission shaft through universal joint. Torque tube is bolted to differential carrier at rear, and front end pivoted in ball-and-socket joint at rear of the transmission. Transmits drive of rear wheels to chassis and absorbs torque reactions due to acceleration and brakes.

FENDERS—One-piece, full crown, wide type.

FRAME—Side bar channel section with wide top flange, carbon steel, *maximum* depth 8", width 30" in front, 35" in rear; flange width at top $3\frac{1}{4}$ ", at bottom $2\frac{1}{8}$ ". Front ends of side members reinforced by plates riveted to side members.

SPRINGS—Semi-elliptic system of suspension with rear springs underslung. Rear shackle of rear spring tension type with universal ball-and-socket connection to frame. Front springs 42" x $2\frac{1}{4}$ "; rear

60" x $2\frac{1}{2}$ ". Double action shock absorbers of hydraulic type, front and rear, with both upward and downward dampening action, give greatly improved riding qualities.

TIRES—7.00-20 (32 inches x 6.75 old designation.)

TOOLS—Complete set of tools in special fabric holder, placed in rain-proof box, concealed in left-hand dust shield. Cover of tool box forms kick pad.

WHEELBASE—140".

TURNING RADIUS—At tires: Right 23 feet. Left 25 feet 1 inch.

GEAR RATIO—Standard 5.08 to 1, Optional—4.75 to 1.

WHEELS—Artillery type, 12 hickory spokes with steel felloes. Adjustable roller bearings, demountable hot rolled split type rim with 6 lugs. Large steel hub flange with 12 bolts. Disc or wire wheels obtainable at additional cost.

SECURITY-PLATE GLAS—*Is fitted in all models both open and closed, for wind-shields and body windows.*

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General Motors Deferred Payment Plan



THE purchase of a motor car out of income is an established custom. Cadillac-LaSalle dealers welcome business on this basis. Should you wish to buy a Cadillac or LaSalle car by monthly payments instead of full payment at the time of purchase the CADILLAC MOTOR CAR COMPANY provides the GENERAL MOTORS Deferred Payment Plan.

This plan is a banking service which enables you to enjoy a Cadillac or LaSalle while you pay for the car out of income. Cadillac-LaSalle dealers will gladly accept your present car at its full market value. It is probable that this value will be sufficient to take care of the down payment and further reduce the monthly payments.

The purchase of a new Cadillac or LaSalle under the GENERAL MOTORS ACCEPTANCE CORPORATION Plan may be arranged as follows:

Model.....

Equipment.....

*Delivered Price \$.....

Credit for Your Car

(Good until..... DATE.....) \$.....

Cash Down Payment \$.....

Total Down Payment \$.....

Deferred obligation for \$.....

Payable at the rate of \$..... per month until paid

*Note: "Delivered Price" includes the GMAC charges together with Fire and Theft Insurance

**CADILLAC-LASALLE
SHOP MANUAL**

Adjustments, Repairs and Lubrication



**Cadillac 341-A, 341-B
LaSalle 303, 328**

Book Number _____

Please refer to the above number when writing us in regard to this Manual

**Service Department
CADILLAC MOTOR CAR COMPANY
DETROIT**

NO 6, 18, 34,
40, 46, 62, 88, 106
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1928-1937-20

Foreword

THIS Shop Manual is a book of reference on the adjustment and repair of Cadillac and La Salle motor cars. It is intended for the use of service men who are already familiar with automobile construction and repairing in general. It is not a text book for those who have had no previous shop experience and does not aim to present instructions in elementary form.

The style in which the information is presented is a distinct departure from the usual book of this sort. Straight reading matter has been eliminated as far as possible and the facts and figures needed by service men are presented briefly in two ways—by illustrations and by tabulated specifications.

At the beginning of each group is a specification table giving clearances, dimensions and other facts important to service men. Explanations, where necessary, follow the specifications in the form of notes. The rest of the information is in picture form on the pages following the specification table.

Our service department invites correspondence with service managers and shop foremen on all matters discussed in the Shop Manual.

CADILLAC MOTOR CAR COMPANY
Detroit, Michigan

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Introduction

Arrangements of Tables

THE subjects covered in the specification tables are listed in alphabetical order in the first column, and the corresponding facts or figures in the column under "Specifications." Under "Remarks" will be found important comments, cautions and references to illustrations and notes.

In cases where a change in construction has been made and the same information does not apply to all cars of the same model, small figures "1" and "2" are used following the model number or letter to designate first and second type construction. Thus, La Salle cars with the first type or cam-operated brakes, are designated as "303¹" and cars used with second type or toggle brakes as "303²". The unit number at which the change was made is given under "Remarks."

One class of information in the specifications consists of limits for the clearance between parts subject to wear. The limits given are of two kinds. "New limits" are those to be observed in replacing worn parts with new parts. "Worn limits" are those beyond which it is inadvisable to continue to use the worn parts if quietness of operation and maximum performance are expected. Some service, although not the most satisfactory, can of course be obtained from parts worn beyond these limits.

Arrangement of Illustrations

The illustrated pages are laid out to show as far as possible in picture form the repair operations, together with the differences and similarities of the various car units.

Unless otherwise specified all illustrations apply to both the Cadillac and the La Salle.

Identification Numbers

EACH Cadillac and La Salle car when shipped carries an engine number which is also a car serial number. This is the number to be used in filling out license and insurance applications and in general reference to the car. The engine number is stamped on the car in two places: On the name plate on the front face of the left side of the dash and on the crankcase just below the water inlet on the right-hand side.

The various units such as the engine, transmission, steering gear, etc., also carry unit assembly numbers. These are located as described in the specification tables. It is important in ordering parts to give, not only the engine number of the car, but also the unit assembly number of the unit to which the part belongs.

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Front Axle

Subject	Cadillac 341		LaSalle 303-328		Specifications	Remarks
Camber of front wheel (angle with vertical).....	A	B	303	328	2½°	Plate 3, Fig. 7
Angle between steering knuckle bolt and vertical.	A	B	.....	.....	5°
	.....	.....	303	328	7½°
Angle between steering knuckle bolt and wheel spindle.....	A	B	97½°	
	.....	.....	303	328	100°
	.....	.....	303	328	7½°
Caster angle.....	A	B ¹	303	328 ¹	2½°—3°	Before front axle unit 3-27619 on 341-B cars and 4-8137 on 328 cars. Beginning with front axle unit 3-27619 on 341-B cars and 4-8137 on 328 cars. See Note 1. Plate 3, Fig. 6.
	.....	B ²	.....	328 ²	1°—2°
	
Angle between spring seat and vertical plane of I-beam.....	A ¹	2½°—3°	Before front axle unit 3-2858. Before front axle unit 2-16018. Beginning with front axle unit 3-2858 on 341-A cars and before front axle unit 3-27619 on 341-B cars. Plate 4, Fig. 5.
	.....	.....	303 ¹	.....	0°
	A ²	B ¹	.....	.....	1°—1½°
	B ²	2½°—3°	Beginning with front axle unit 2-27619. Beginning with front axle unit 2-16018 on 303 cars and before front axle unit 4-8137 on 328 cars. Plate 4, Fig. 6.
	.....	.....	303 ²	328 ¹	1¼°—1¾°
	.....	.....	.....	328 ²	0°
Correct installation of I-beam (identification mark).....	303	328 ¹	"F" on right spring pad	
	A	B	.....	328 ²	"F" on front face of I-beam
I-beam twist (misalignment between steering knuckle bolts).....	A	B	303	328	½° allowable variation between ends	See note 2.
Clearance between steering knuckle bolt and bushing....	A	B	New limits, .0015-.0025 in. Worn limit, not over .005 in.	
	.....	.....	303	328	New limits, .0005-.0025 in. Worn limit, not over .005 in.
	.....	.....	303	328	Worn limit, not over .010 in.
Pivot balls, out of round.....	A	B	303	328	8⅛ inch	Before front axle unit 2-16001. Plate 3, Fig. 4
Road clearance under front axle	A	B	.....	.....	9⅛ inch
	.....	.....	303	328	.....
Steering cross rod adjustment.....	303 ¹	Tighten and back off one cot-ter pin hole	Beginning with front axle unit 2-16001 on 303 cars. Plate 3, Figs. 3-5.
	A	B	303 ²	328	Automatic adjustment	
Steering cross rod springs—Free length.....	A	B ¹	1⅞ in. approximately	Install second-type pivot seat springs in steering cross rod ends before front axle unit 3-21101.
	.....	B ²	.....	.....	1⅞ in. approximately

FRONT AXLE

Subject	Cadillac 341		LaSalle 303-328		Specifications	Remarks
Compression.....	...	...	303	328 ¹	$\frac{3}{4}$ in. approximately	Install second-type pivot seat springs in steering cross rod ends before front axle unit 4-3801.
	A	B ¹	...	328 ²	$\frac{3}{4}$ in. approximately	Install second-type pivot seat springs in steering cross rod ends before front axle unit 3-21101.
	...	B ²	...	...	180-220 lbs. compressed to $\frac{5}{8}$ in.	
	...	...	303	328 ¹	90-110 lbs. compressed to $\frac{5}{8}$ in.	Install second-type pivot seat springs in steering cross rod ends before front axle unit 4-3801.
Steering knuckle thrust bearing adjustment.....	...	...	303	328 ¹	180-220 lbs. compressed to $\frac{5}{8}$ in.	
	...	...	...	328 ²	90-110 lbs. compressed to $\frac{5}{8}$ in.	Tapered roller bearing. Tighten dust-cap securely against roller bearing. <i>Plate 1.</i>
	A	B	...	...	Tighten and back off just enough to free adjustment	
	...	...	303	328	Not over .004 in. end play	Ball bearing. Adjust with shims .003 and .005 in. thick. <i>Plate 2.</i>
Stop screw adjustment.....	A	B	303	328	$\frac{1}{2}$ - $\frac{3}{4}$ in. clearance between tire and nearest point of possible interference.	Interference with steering connecting rod on left side and spring on right side. Also shock absorber brackets.
Toe-in of front wheels.....	...	...	303 ¹	...	$\frac{1}{8}$ in. preferable, $\frac{1}{4}$ in. maximum.	Adjust by spacers $\frac{1}{8}$ in. and $\frac{1}{4}$ in. thick. Before front axle unit 2-16001. <i>Plate 3, Figs. 1-2-4.</i>
	A	B	303 ²	328	$\frac{1}{8}$ in. preferable, $\frac{1}{4}$ in. maximum.	Adjust by turning steering cross rod. Beginning with front axle unit 2-16001 on 303 cars. <i>Plate 3, Figs. 1-2-3-5.</i>
Tread.....	A	B	303	328	56 in.	
Unit number, location of.....	A	B	303	328	Top right on I-beam	

1. Caster Angle

To measure the caster angle, use a Bear or Duby Gauge as shown in *Plate 3, Figs. 8, 11*. Be sure to have all four wheels the same distance off the floor. Floor must be level.

On early 341-A and 303 cars, the spring seats are not machined at the same angle as on later cars. To give these cars the standard caster angle specified in the table, use tapered shims (*Fig. 9*) between the springs and the axle. Place the thick edges of the shims toward the rear.

2. Straightening Bent Parts

Because of their location the parts of the front axle are more subject to damage by accident than any other part of the chassis. Front axle service, therefore, involves the inspection of parts for alignment and possible straightening.

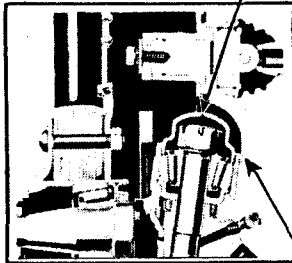
Heat-treated parts should not be straightened if they are sprung out of alignment more than 5°. To straighten such parts while cold is likely to result in strains and sometimes in cracks not visible to the naked eye. Straightening with heat destroys the effect of previous heat treatment and may result either in overheating, making the steel soft and weak, or in underheating, which will make it brittle and easily broken.

Parts which are not heat-treated may be straightened cold if not sprung out of alignment more than 10°.

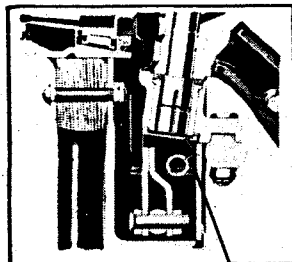
Welding of parts subjected to severe strain should never be permitted. A welded part is never as strong as the original, unbroken metal and the heat required for the welding process changes the structure of the metal around the weld, making it coarse and weak.

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Punch 1/8-inch hole in dust cap for grease overflow



Position of cover plate on first cars. Remove and place inside as on later cars



First type dust cap attached by cap screws. Avoid forcing grease in under heavy pressure

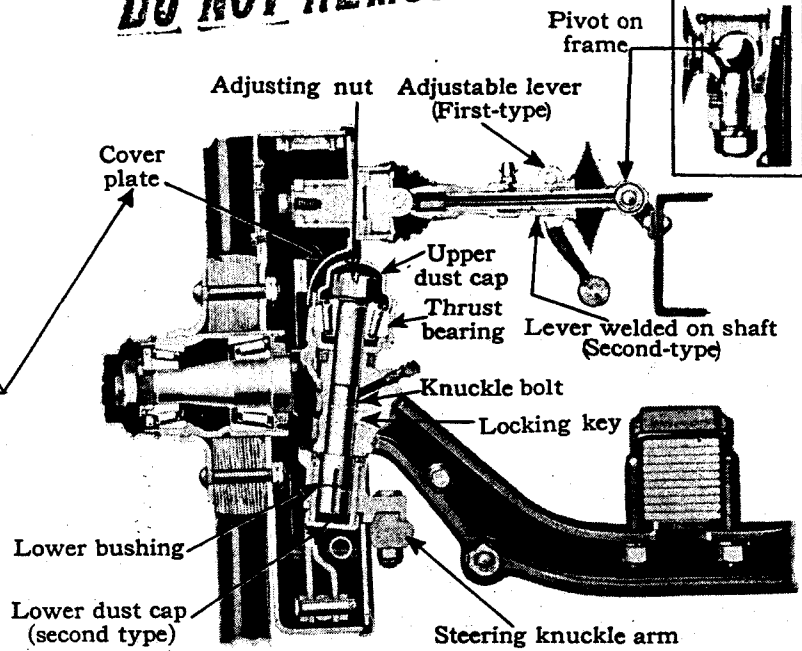


Fig. 1
Cadillac 341-A

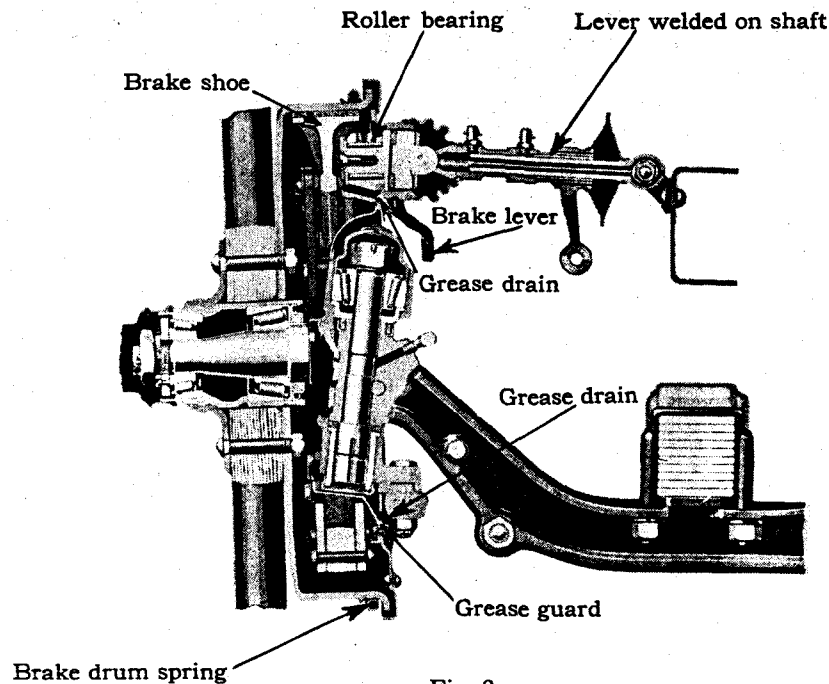


Fig. 2
Cadillac 341-B

Plate 1. Sectional view of Cadillac front wheel hub and steering knuckle.

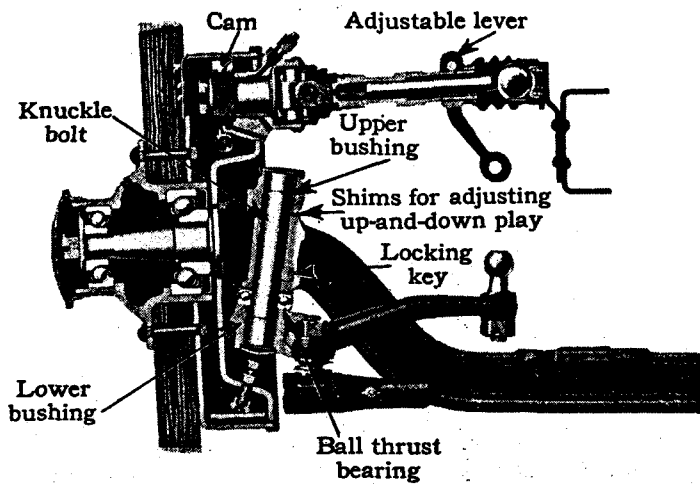


Fig. 1
LaSalle 303
(first type with cam-operated brakes)

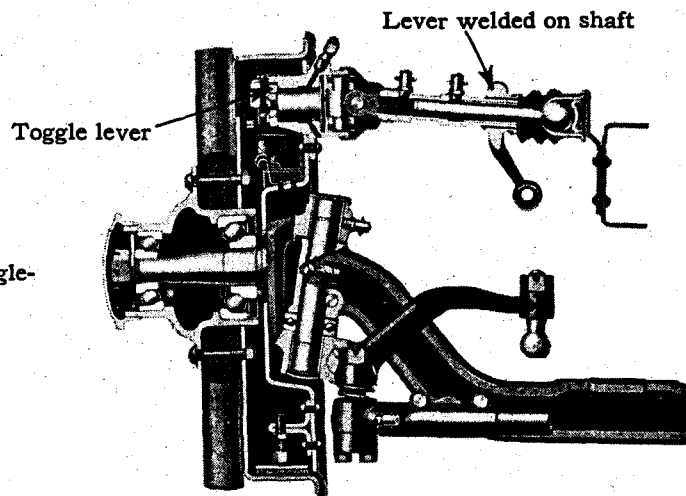


Fig. 2
LaSalle 303
(second type with toggle-operated brakes)

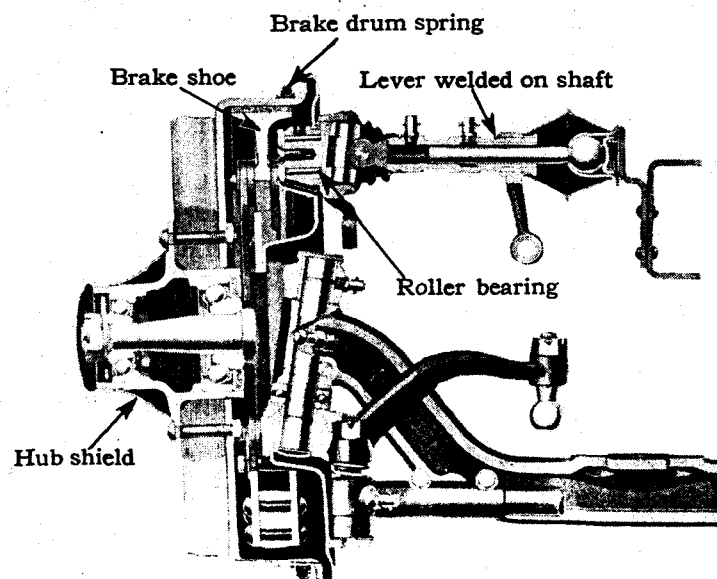


Fig. 3
LaSalle 328

Plate 2. Sectional view of La Salle front wheel hub and steering knuckle.

FRONT AXLE

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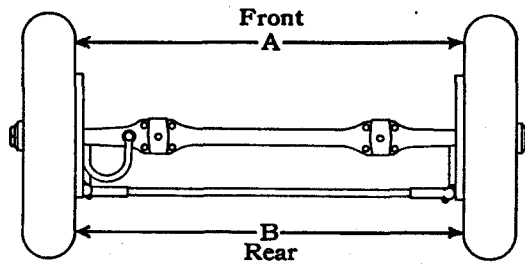


Fig. 1
Front wheel alignment.
A should be 1/8 to 1/4 inch less than B

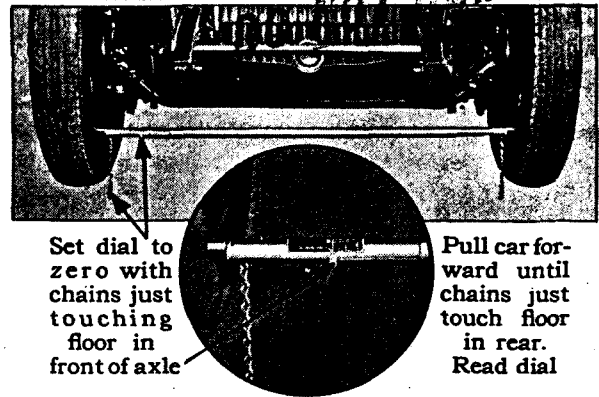


Fig. 2
Front wheel alignment gauge

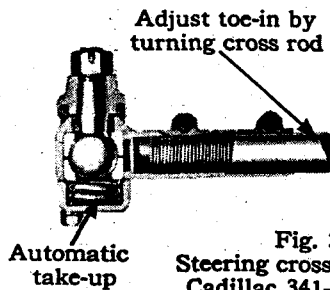


Fig. 3
Steering cross rod joint
Cadillac 341-A and B

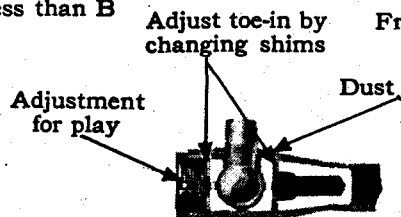


Fig. 4
Steering cross rod joint
LaSalle 303 (first type)

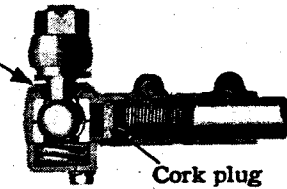


Fig. 5
Steering cross rod joint
LaSalle 303 (second type) and 328

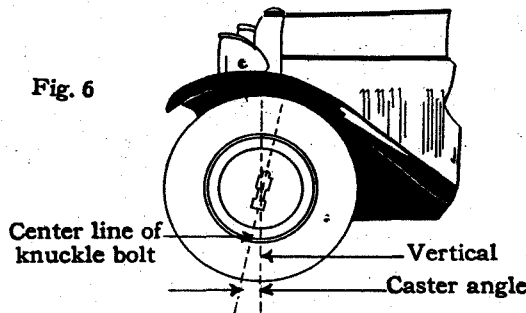


Fig. 6

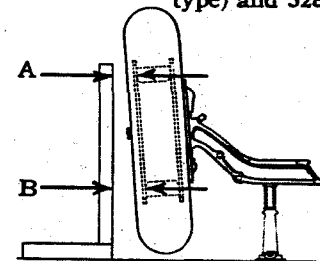


Fig. 7
Front wheel camber.
A should be 3/4 inch less than B

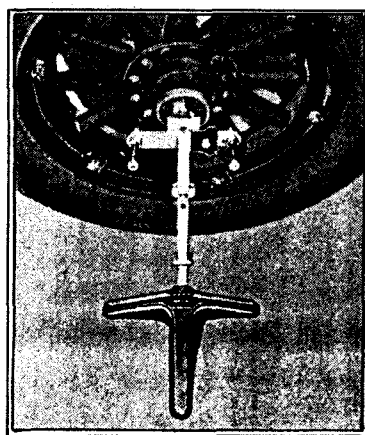


Fig. 8
Bear gauge for measuring
caster angle

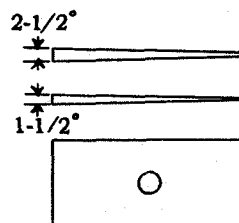


Fig. 9
Wedges for changing
caster angle

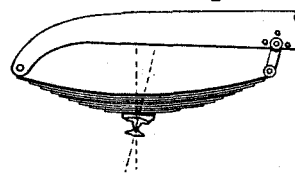


Fig. 10
To increase caster, insert
wedges with thick edge
toward rear

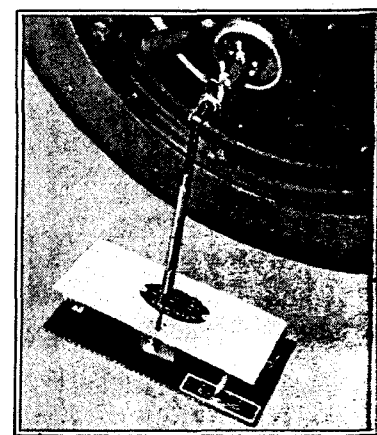


Fig. 11
Doby gauge for measuring
caster and camber

FRONT AXLE

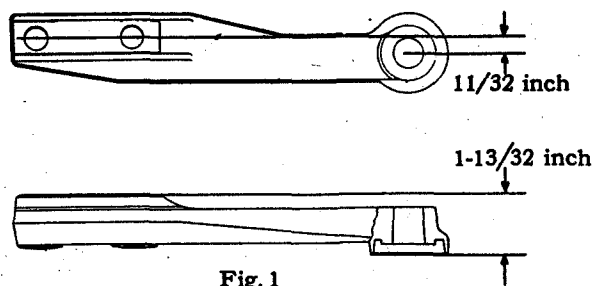


Fig. 1
R. H. Arm, Cadillac 341-A and B

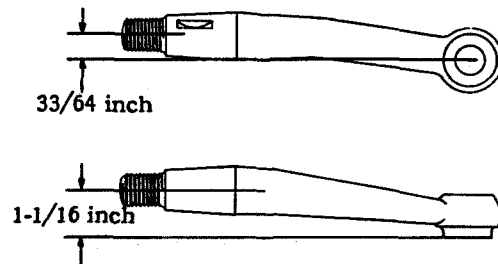


Fig. 2
R. H. Arm, LaSalle 303 and 328

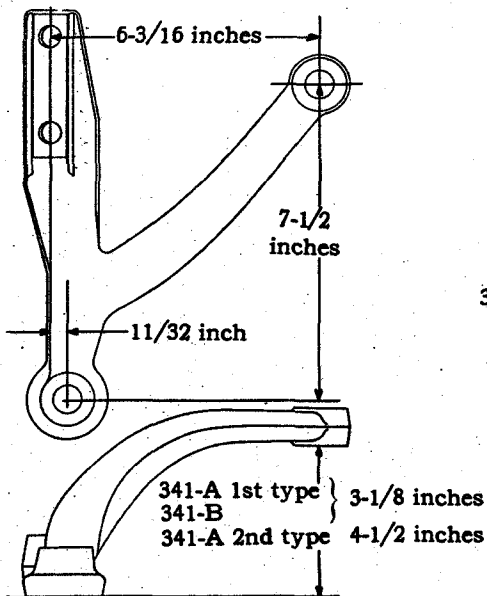


Fig. 3
L. H. Arm, Cadillac 341-A and B

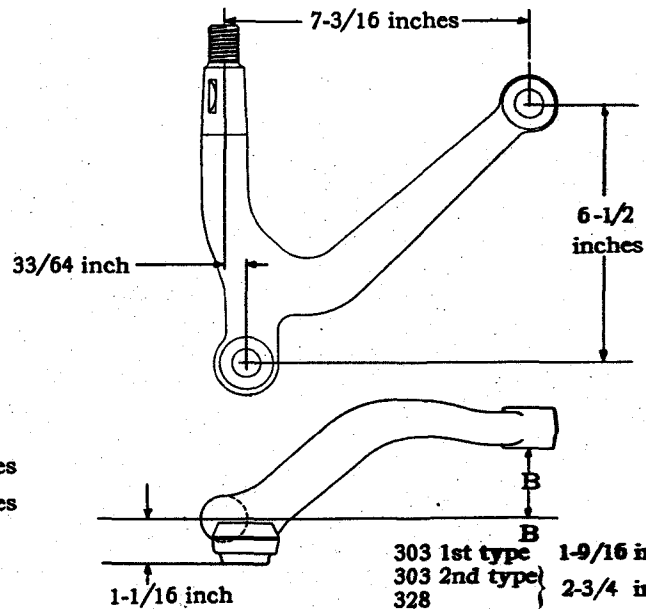


Fig. 4
L. H. Arm, LaSalle 303 and 328

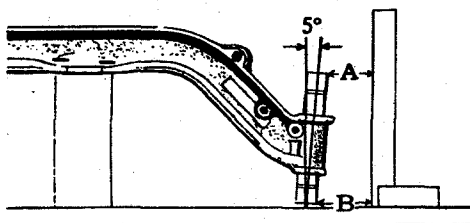


Fig. 5
Axle I-beam, Cadillac
A should be 1 inch
less than B
C should be 1/2 inch
less than D

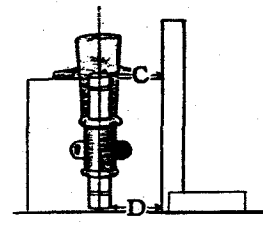
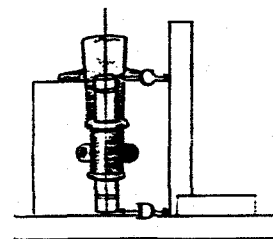


Fig. 6
Axle I-beam, LaSalle
A should be 55/64 inch
less than B
The dimensions C and
D should be equal



Rear Axle and Torsion Tube

Subject	Cadillac 341		LaSalle 303-328		Specifications	Remarks
Axle shaft, clearance between driver and recesses in wheel hub.....	A	B			New limits, .0005-.0025 in. Worn limit, not over .005 in.	
Axle shaft length, left side.....	A	B	303	328	30 $\frac{11}{16}$ in. overall 31 $\frac{11}{16}$ in. overall 32 $\frac{5}{8}$ in. overall	
Axle shaft length, right side.....	A	B	303	328	33 $\frac{1}{4}$ in. overall 34 $\frac{1}{4}$ in. overall 35 $\frac{1}{4}$ in. overall	
Axle shaft, out of true.....	A	B	303	328	Not over $\frac{1}{16}$ inch	
Axle housing, out of true.....	A	B	303	328	Not over $\frac{1}{16}$ inch	Ideal gauge, Tool 102789, can be used to check alignment of rear wheels as well as front wheels. <i>Plate 7, Fig. 4.</i>
Differential carrier, installation of.....	A	B	303	328		See Note 1
Drive shaft, clearance between sleeve and splines on pinion shaft.....	A	B	303	328	New limits, .000-.003 in. Worn limit, not over .006 in.	
Driveshaft, clearance between splines and hub of universal joint.....	A	B	303	328	New limits, .001-.005 in. Worn limit, not over .006 in.	
Driveshaft, length.....	A		303	328	140 in. wheelbase—61 $\frac{1}{4}$ in. 152 in. wheelbase—73 $\frac{1}{4}$ in. 125 in. wheelbase—50 $\frac{7}{8}$ in. 134 in. wheelbase—59 $\frac{7}{8}$ in. 140 in. wheelbase—62 $\frac{1}{4}$ in. 152 in. wheelbase—74 $\frac{1}{4}$ in. 125 in. wheelbase—49 $\frac{1}{8}$ in. 134 in. wheelbase—58 $\frac{1}{8}$ in.	
Driveshaft, out of true.....	A	B	303	328	Not over .010 in.	
Gear ratio, high.....	A	B	303	328	4.39:1 4.07:1	
Gear ratio, medium.....	A	B	303	328	4.75:1 4.54:1	Stamped on top of differential carrier.
Gear ratio, low.....	A	B	303	328	5.08:1 4.91:1	
Gear adjustment or replacement	A	B	303	328		See Note 2.
Lubrication.....	A	B	303	328		See Lubrication Table, page 83.
Removal of rear axle and torsion tube assembly.....	A	B	303	328		See Note 3.
Road clearance under rear axle.	A	B	303	328	8 $\frac{1}{4}$ inch 7 $\frac{1}{4}$ inch	At center under differential.
Tread.....	A	B	303	328	56 inches 58 inches	
Type of axle.....	A	B	303	328	Full floating Three-quarter floating	
Unit number, location of.....	A	B	303	328	Rear surface of housing, right side	

1. Lubrication of Pinion Bearings

Differential carrier assemblies shipped by the Parts Division have no lubricant in the bearings, as all the lubricant is washed out before the assemblies are shipped.

Before an assembly is installed in a car, it is important that care be taken to see that the lubricant reaches the front pinion bearing. It is not enough simply to install the assembly and add lubricant to the proper level. Before the lubricant has a chance to work up into the pinion bearing the bearing may be damaged.

The best plan is to stand the assembly up on the front end and pour in enough lubricant to make sure that the ball bearings are thoroughly lubricated. The assembly can then be installed and the necessary additional lubricant added to bring up the level. In this way lubrication of the ball bearings is provided for until the oil in the housing works up through the bearings.

2. Gear Adjustment

The rear axle gears are correctly adjusted when the axle is assembled, and their positions must not be changed. If the gear and pinion require replacement, the entire differential carrier assembly should be replaced. Differential carrier assemblies for replacement can be obtained from the Factory Parts Department on an exchange basis.

It is very important that every assembly returned to the factory be accompanied by the original shims.

3. Removal of Rear Axle and Torsion Tube

It is customary for work on the rear axle to remove the axle and torsion tube as an assembly by disconnecting the torsion tube from the ball-and-socket joint and removing the spring clips. On 341 Cadillac cars the rear ends of the rear springs must also be disconnected because the springs are underslung.

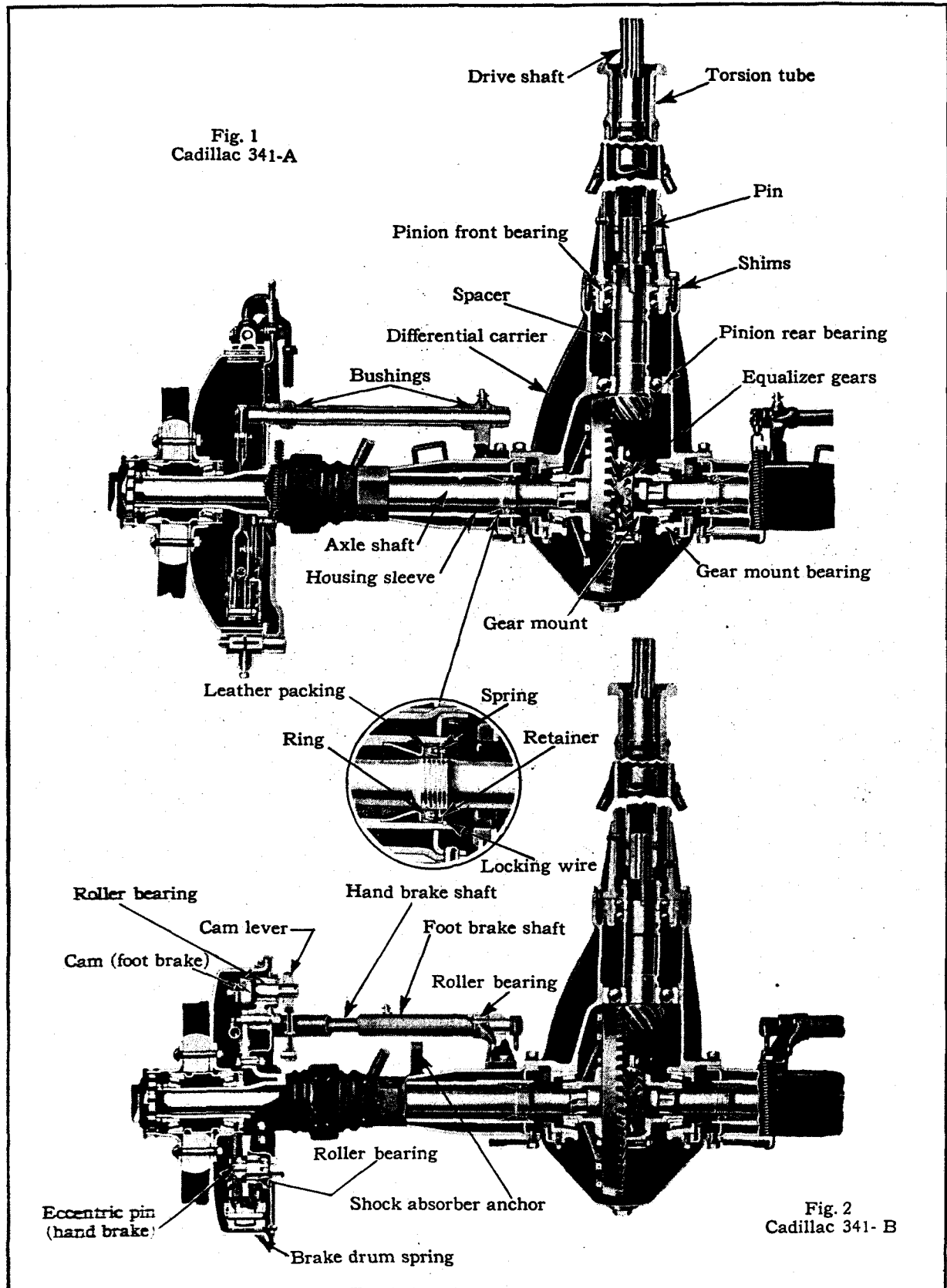


Plate 5. Sectional View of Cadillac Rear Axle.

REAR AXLE AND TORSION TUBE

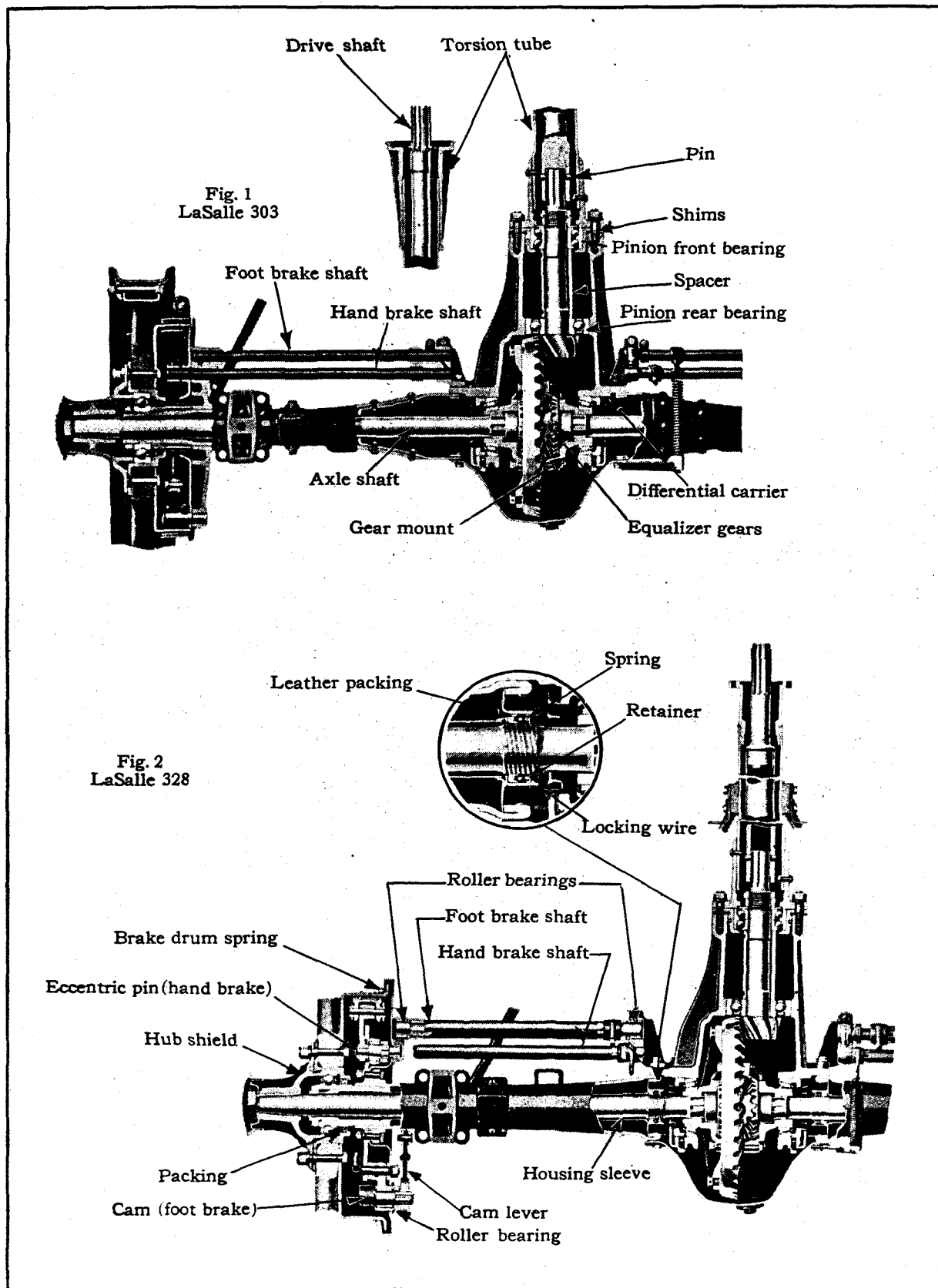


Plate 6. Sectional View of La Salle Rear Axle.

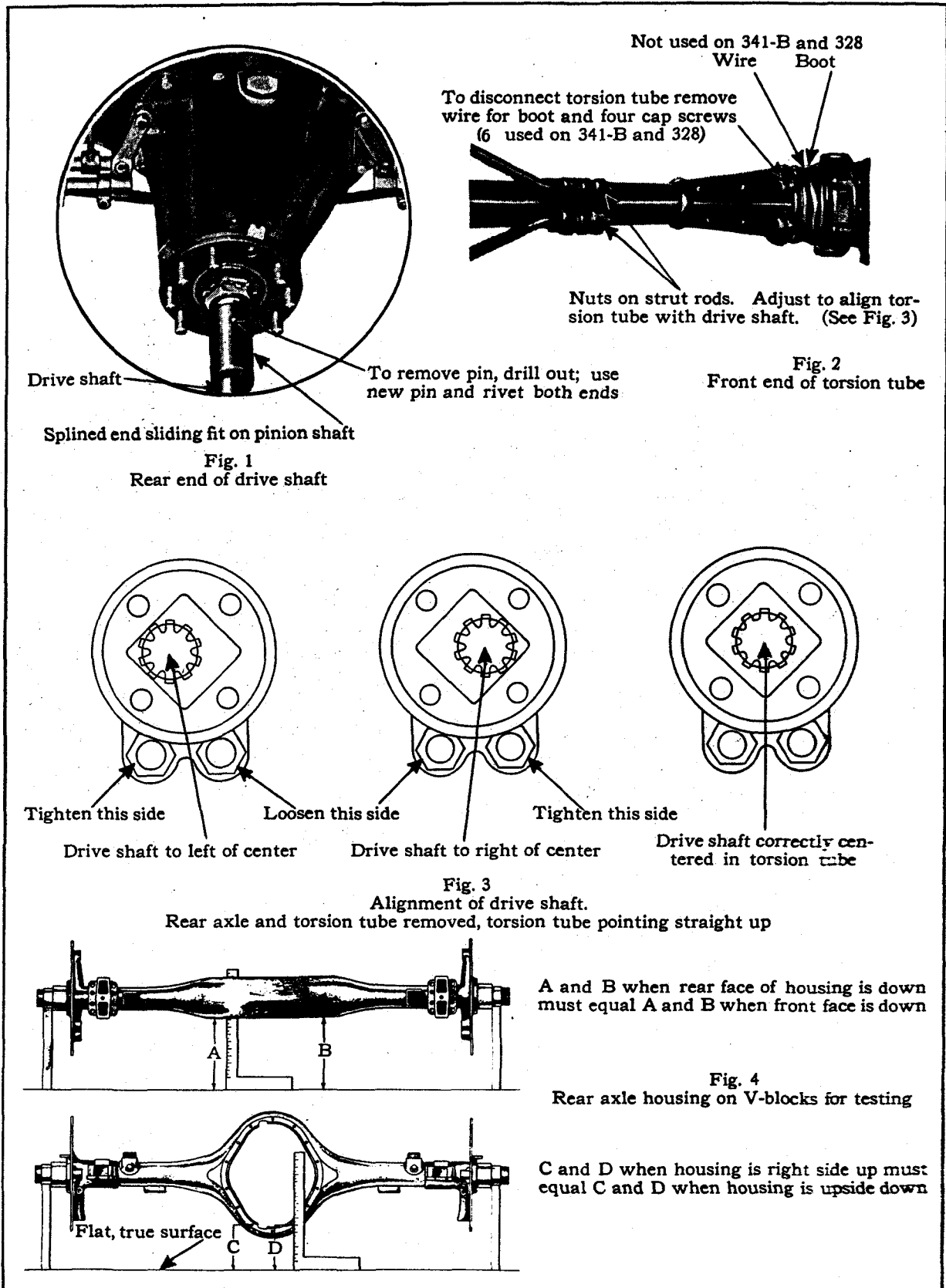


Plate 7. Torsion tube, drive shaft and axle housing.

Brakes

Subject	Cadillac 341	LaSalle 303-328	Specifications		Remarks
FOOT BRAKES					
Front and Rear (Shoe type)					
Clearance between lining and drum.....	B	328			Clearance determined by number of turns of adjusting nut. <i>Plates 10, 11, Figs. 2, 4.</i>
Drum, nominal inside diameter.....	B	328	16½ in., front and rear		
Drum, out of round.....	B	328	15 in., front and rear		
Drum, thickness.....	B	328	Not over .007 in.		Drums not to be ground in service over .040 in. less than minimum original thickness.
	B	328	¼ in.		
	B	328			
Lining (Front and Rear)			Short Shoe	Long Shoe	Beginning with front axle unit 3-31441 and rear axle unit 3-31525 on 341-B cars and front axle unit 4-13424 and rear axle unit 4-13409 on 328 cars lead tips are installed at the trailing end of the long shoes. Replace lead tips when installing new linings, using lining rivets.
Length without lead tip.....	B	328	7⅞ in.	16¾ in.	
		328	6⅜ in.	15⅞ in.	
Length with lead tip.....	B	328		15⅞ in.	
		328		13⅞ in.	
		328			
Lining, thickness.....	B	328	⅜ in.		Measured between loops Measured between loops
Lining, width.....	B	328	2¼ in.		
		328	2 in.		
Pull back spring for rear brake, free length.....	B	328	4¾ in., approximately		
		328	4¼ in., approximately		
Pull back spring for rear brake, tension.....	B	328	32-37 lbs stretched to 7¾ in.		
		328	19-24 lbs stretched to 6½ in.		
FRONT (Band type)					
Clearance between lining and drum.....	A	303	.015 in.		Before front axle unit 3-6001. Beginning with front axle unit 3-6001. Before front axle unit 2-16608. Beginning with front axle unit 2-16608.
Drum, nominal outside diameter.....	A ¹		16 in.		
	A ²		17 in.		
		303 ¹	14 in.		
		303 ²	16 in.		
Drum, out of round.....	A	303	Not over .015 in.		
Drum, thickness.....	A	303	⅜ in. }		Drums not to be ground in service over .040 in. less than minimum original thickness. Before front axle unit 3-6001. See note 1. Beginning with front axle unit 3-6001. See note 1. Before front axle unit 2-16608. See note 1. Beginning with front axle unit 2-16608. See note 1.
		303	⅜ in. }		
Lining, length.....	A ¹		41¾ in., approximately		
	A ²		45¾ in., approximately		
		303 ¹	36⅞ in., approximately		
		303 ²	41½ in., approximately		
Lining, thickness.....	A	303	⅜ in.		
Lining, width.....	A		2¼ in.		
		303	2 in.		
REAR (Band type)					
Clearance between lining and drum.....	A	303	.030 in.		

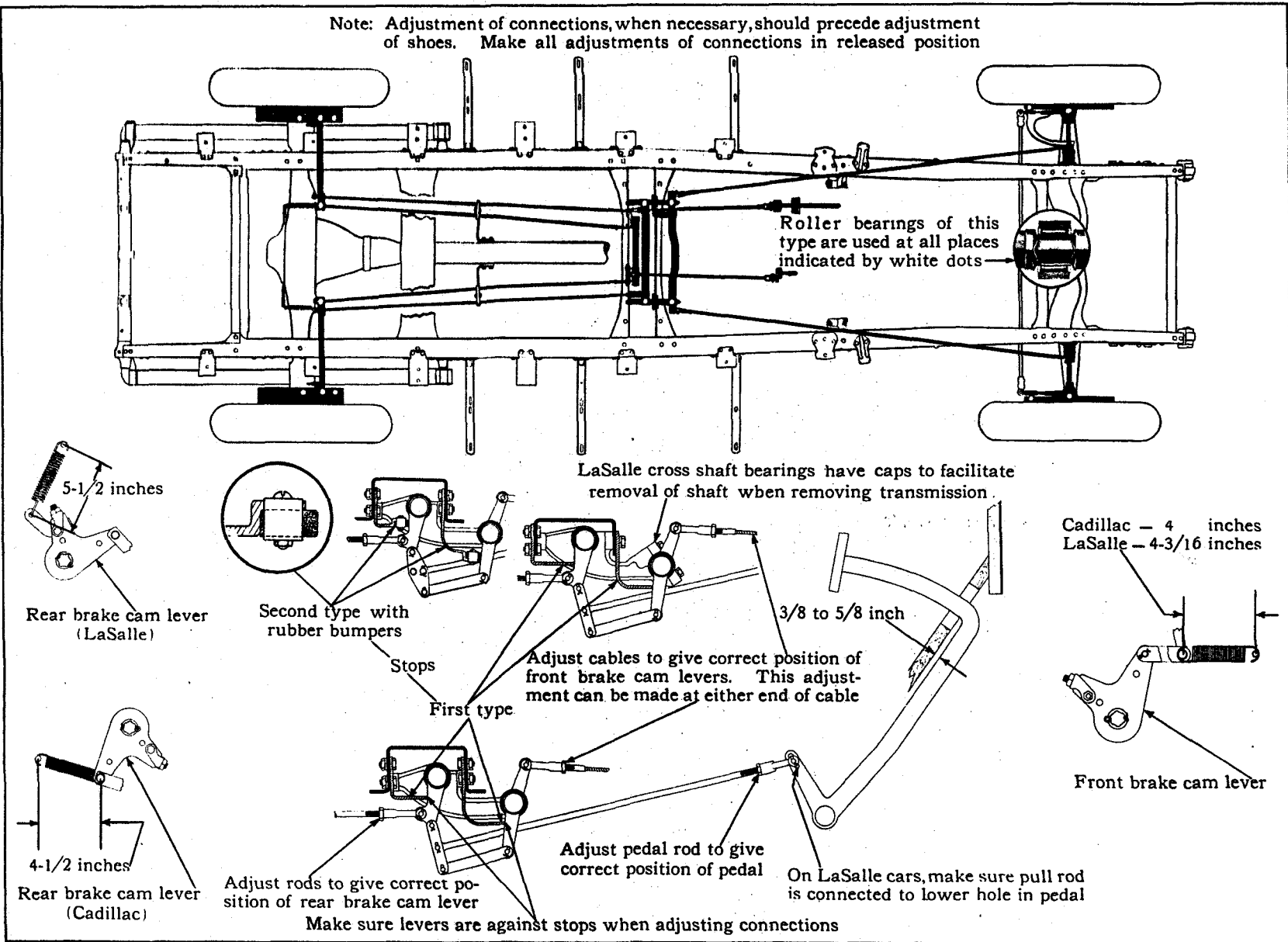


Plate 8. Adjustment of Cadillac 341-B and La Salle 328 brake connections—first type

Subject	Cadillac 341		LaSalle 303-328		Specifications	Remarks
Drum, nominal outside diameter.....	A				16 in. 14 in.	
Drum, out of round.....	A		303		Not over .015 in.	
Drum, thickness.....	A				$\frac{11}{16}$ in. $\frac{1}{8}$ in.	
Lining, length.....	A				49½ in., approximately } 39 in., approximately }	See note 1.
Lining, thickness.....	A		303		$\frac{1}{8}$ in.	
Lining, width.....	A ¹				2½ in.	Before rear axle unit 3-12529.
	A ²				2¼ in.	Beginning with rear axle unit 3-12529.
			303		2 in.	
Pull back spring for rear brake rod, free length....	A		303		4¼ in., approximately	
Pull back spring for rear brake rod, tension.....	A		303		19-24 lbs. stretched to 6½ in. between loops	
HAND BRAKES						
Clearance between rocker shaft and bushings.....	A	B	303	328	New limits .004 to .008 in. Worn limit, not over .012 in.	
Lining, length.....	A				40¾ in., approximately } 40¼ in., approximately }	See note 1.
		B			10 $\frac{1}{16}$ in.	
				328	9½ in.	
Lining, thickness.....	A	B		328	$\frac{1}{8}$ in.	
			303		$\frac{1}{8}$ in.	
Lining, width.....	A			328	2 in.	
			303		1½ in.	
		B			2¼ in.	

1. Length of Lining

The lengths given for the lining on 341-A and 303 cars allow for cutting to length to suit each individual band. The most economical method is to purchase lining in rolls

and cut to length when installing. Lining for external bands should be cut $\frac{1}{8}$ in. longer than the band. Lining for internal bands should be cut $\frac{1}{8}$ in. shorter than the band.

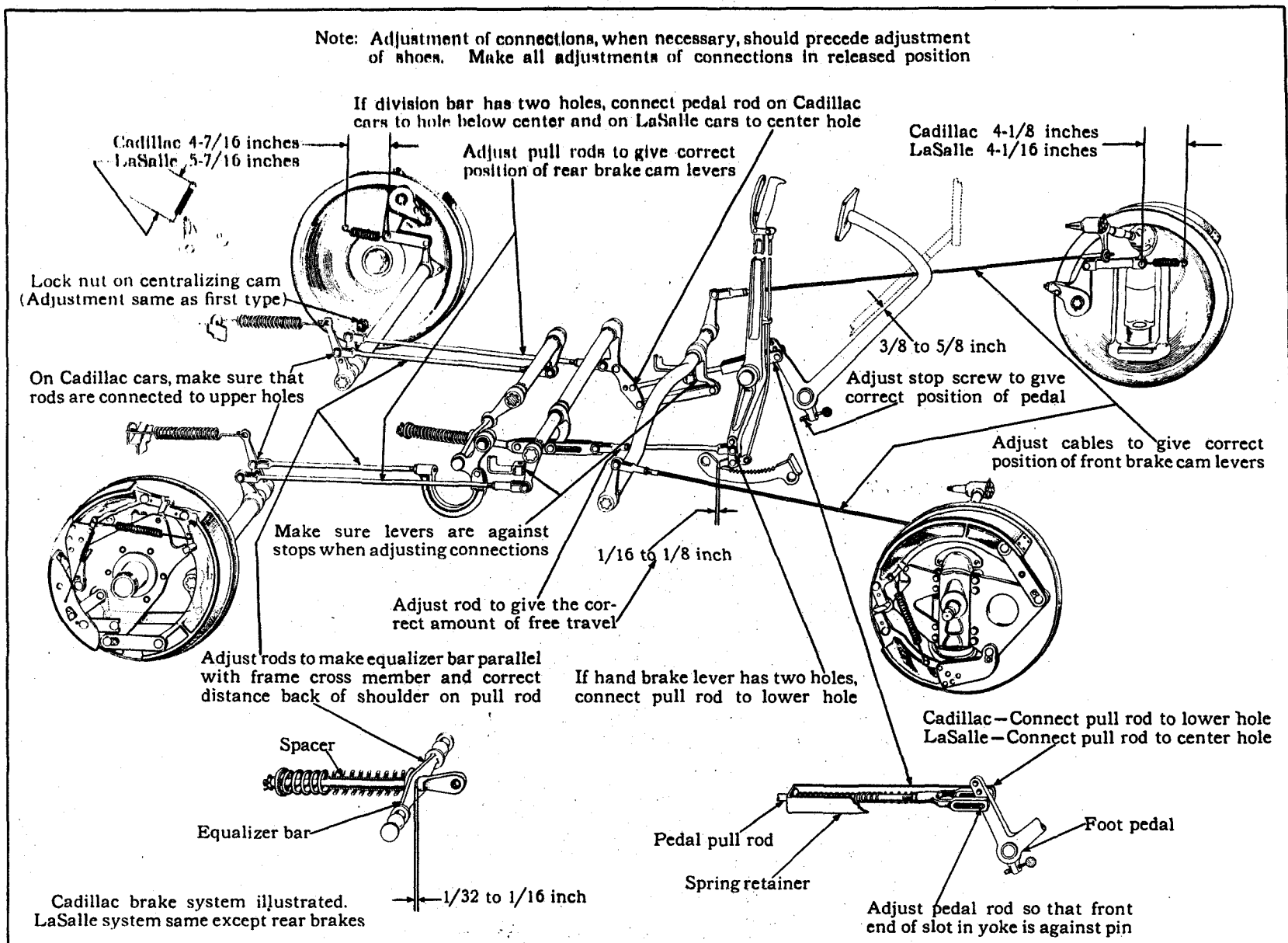
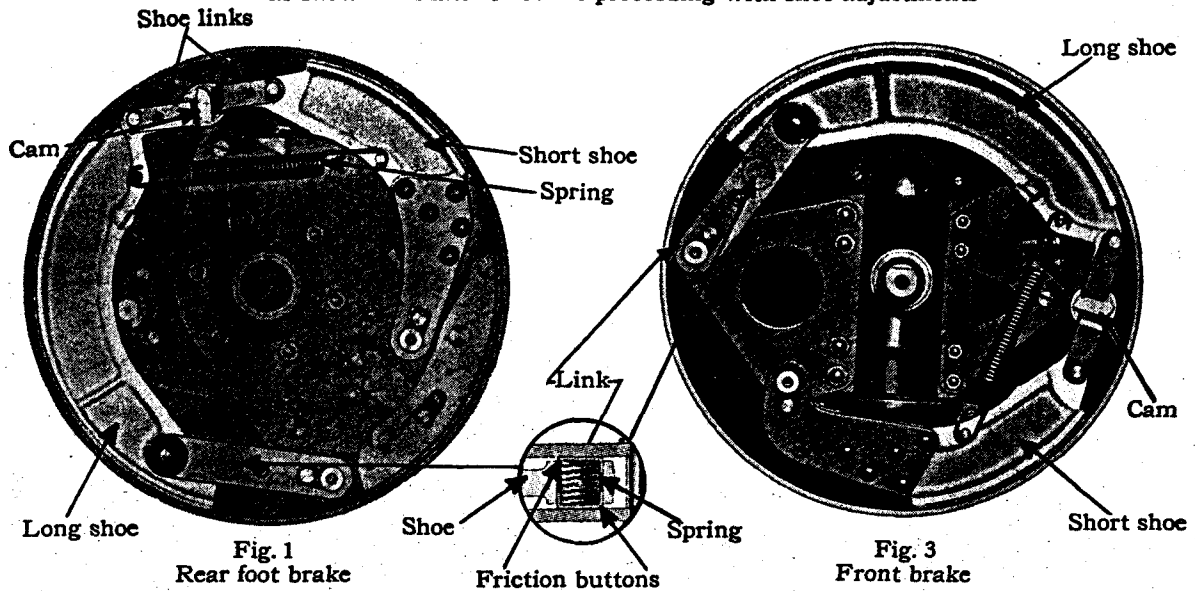


Plate 9. Adjustment of Cadillac 341-B and La Salle 328 brake connections—second type.

Note: Unless brake connections are known to be O. K., check them as shown in Plate 8 before proceeding with shoe adjustments



Loosen nut and apply brakes firmly to centralize cam bracket. Tighten nut before releasing brakes. (See Fig. 7 for cam bracket)

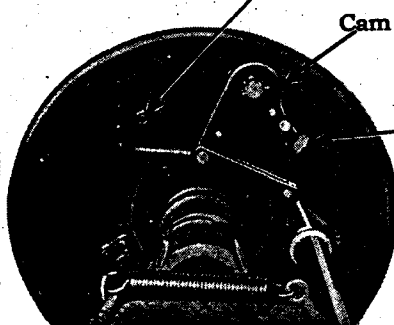


Fig. 2
Rear brake adjustment

Check for equalization between right and left. If O. K., turn down all four adjusting nuts same number of turns until pedal travel is approximately 2-1/4 inches. (1-1/6 turns equals 1 inch pedal travel)

If equalization is not O. K., first turn down nuts until all four wheels just drag; then back off nuts same number of turns to give proper pedal travel. Recheck for equalization and make further adjustment if necessary

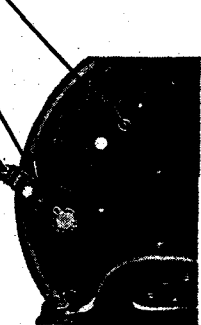


Fig. 4
Front brake adjustment

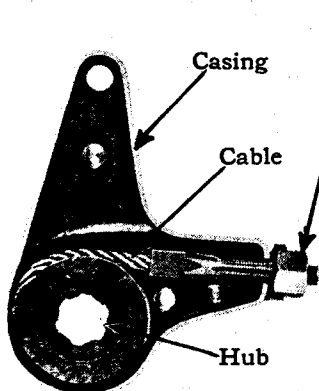


Fig. 5
Cam lever with half of casing removed

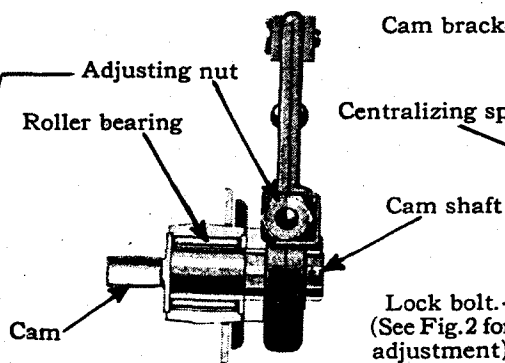


Fig. 6
Sectional view of cam shaft bearing

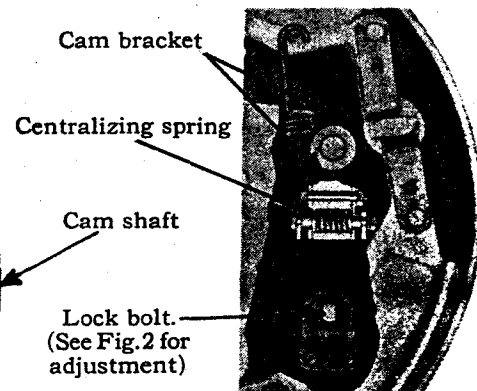


Fig. 7
Sectional view of cam centralizing bracket

BRAKES

Note: Unless brake connections are known to be O. K., check them as shown in Plate 9 before proceeding with shoe adjustments

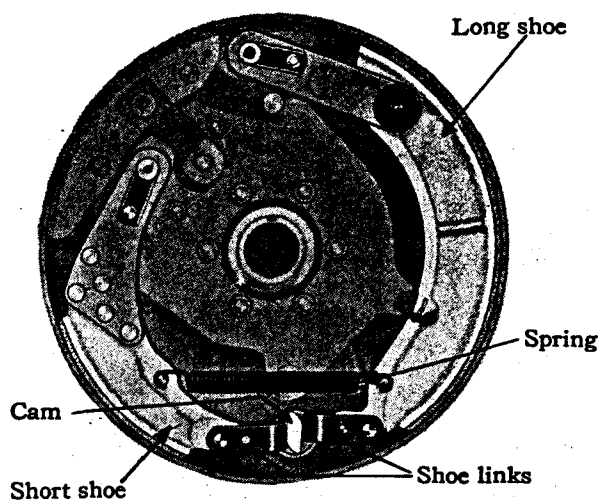


Fig. 1
Rear foot brake

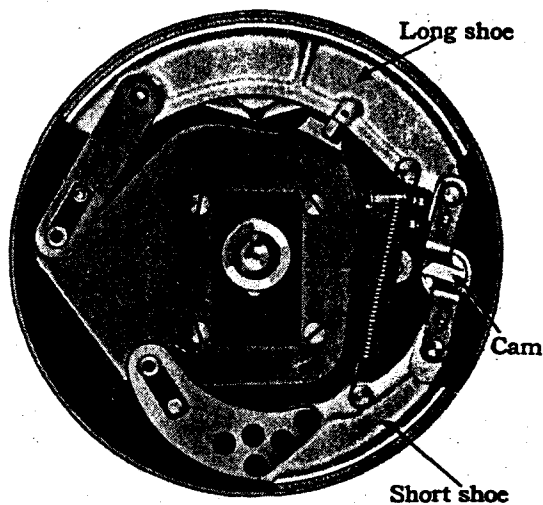


Fig. 3
Front brake

Loosen nut and apply brakes firmly to centralize cam bracket. Tighten nut before releasing brakes. (See Fig. 7 for cam bracket)

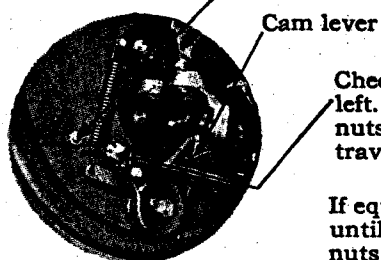


Fig. 2
Rear brake adjustment

Check for equalization between right and left. If O. K., turn down all four adjusting nuts same number of turns until pedal travel is approximately 2-1/4 inches. (1-1/6 turns equals 1 inch pedal travel)

If equalization is not O. K., first turn down nuts until all four wheels just drag; then back off nuts same number of turns to give proper pedal travel. Recheck for equalization and make further adjustment if necessary

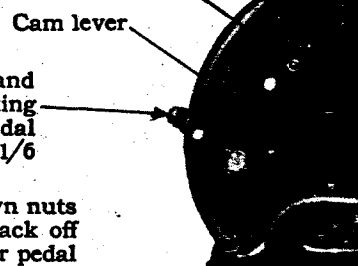


Fig. 4
Front brake adjustment

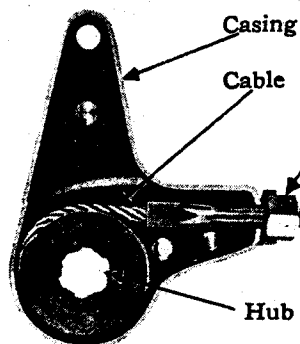


Fig. 5
Cam lever with half of casing removed

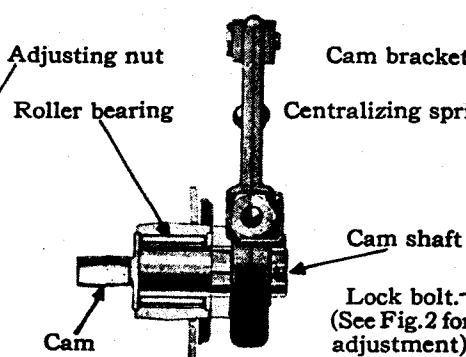


Fig. 6
Sectional view of cam shaft bearing

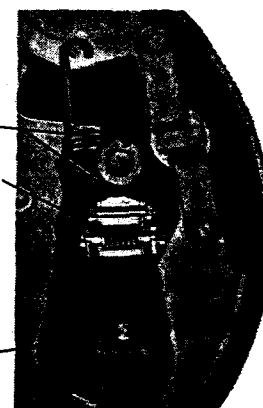


Fig. 7
Sectional view of cam centralizing bracket

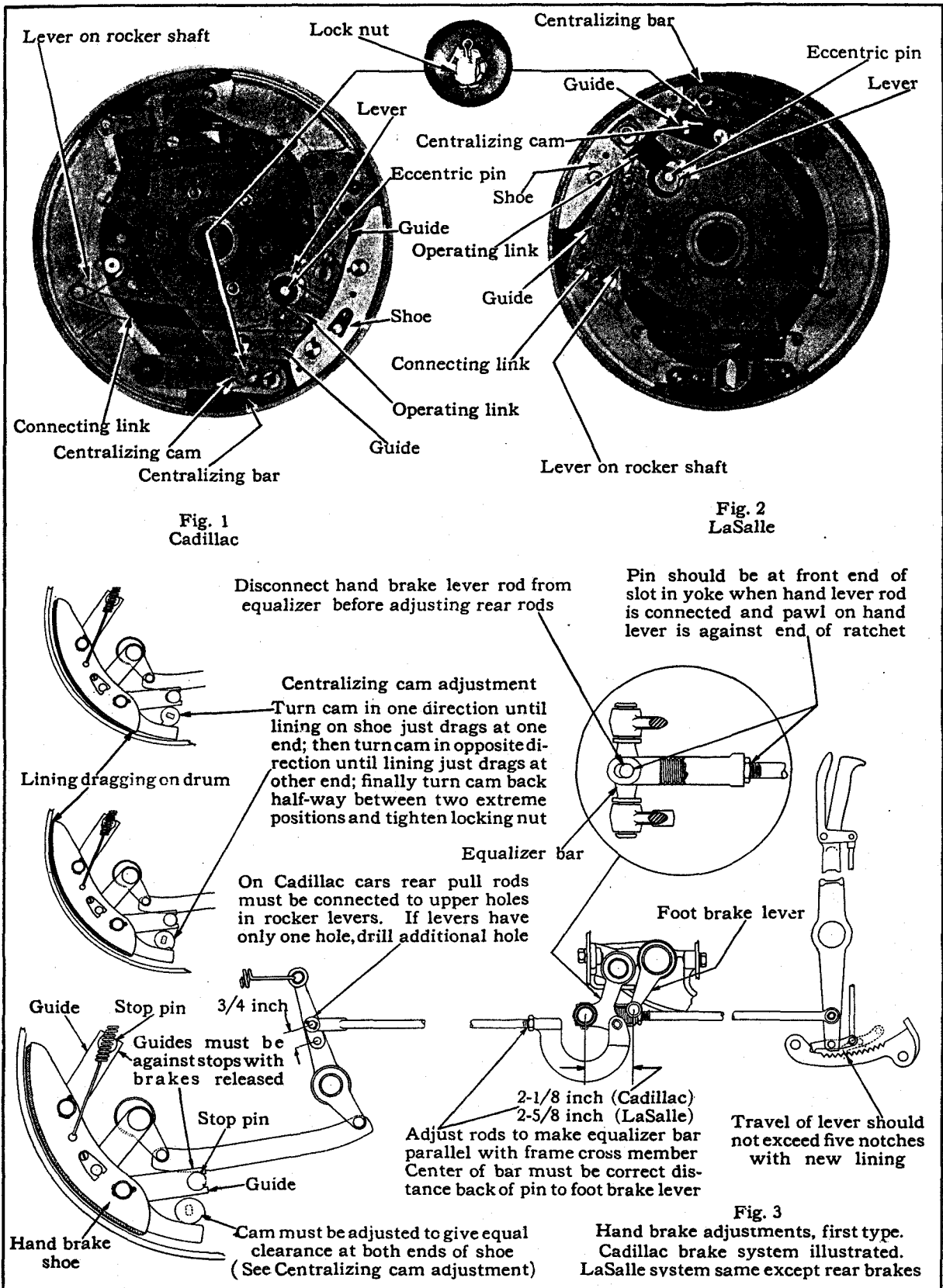
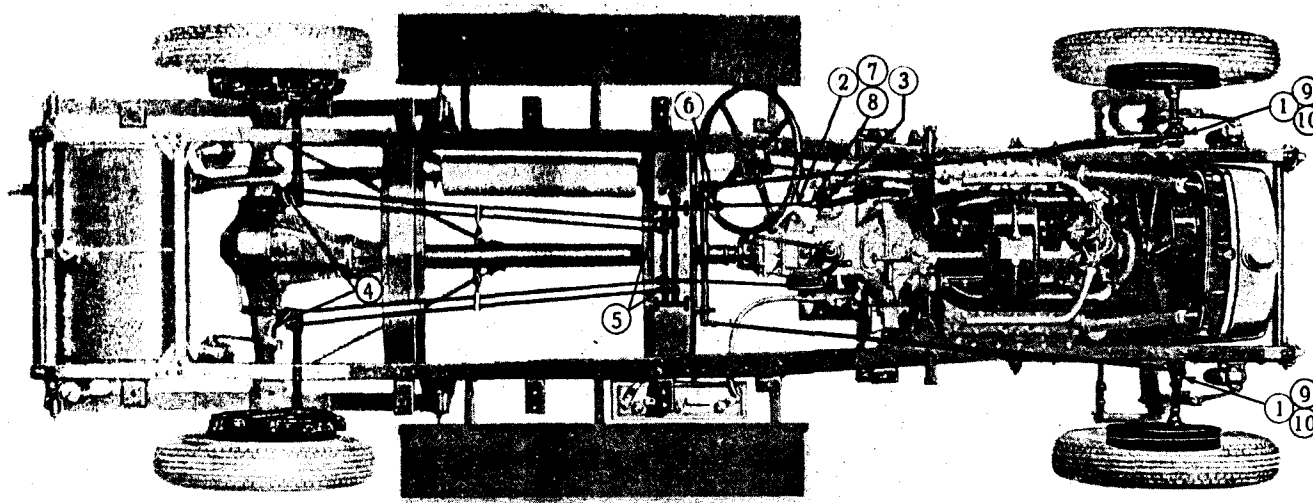


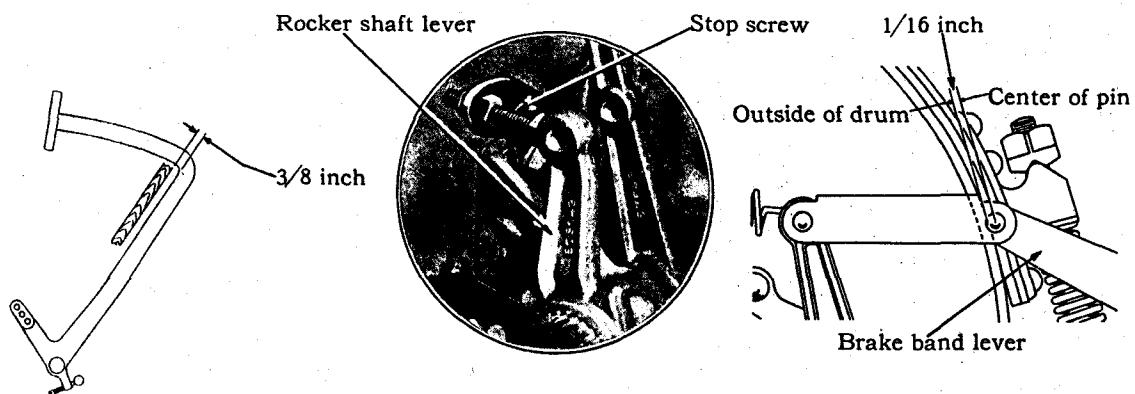
Plate 12. Cadillac 341-B and La Salle 328 hand brakes—first type.

Note: Adjustment of connections must precede adjustment of bands. Connections must also be freed up before adjustment. Make all adjustments of connections in released position

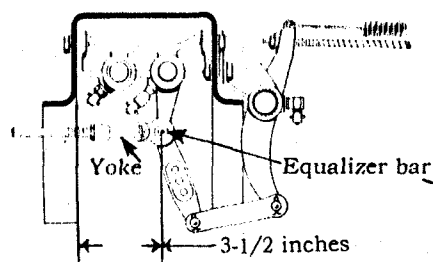


- Preliminary { 1 Back off nuts on front ends of cables
2 Remove pedal rod and yoke assembly

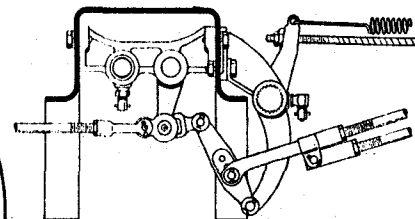
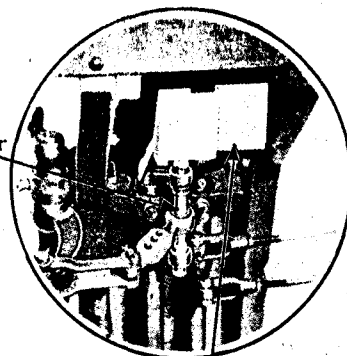
Gauge 109603



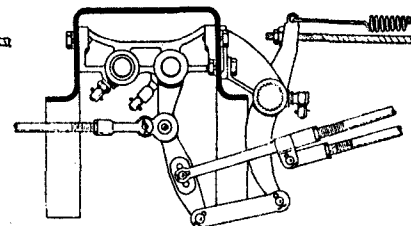
- 3 Adjust pedal stop screw 4 Adjust stop screws in rocker shaft levers to give correct position of brake band levers. Preferably use gauge



- 5 Adjust yokes on rods to give correct position of equalizer bar. Preferably use gauge



- First type hook-up.
Use bottom hole in division bar

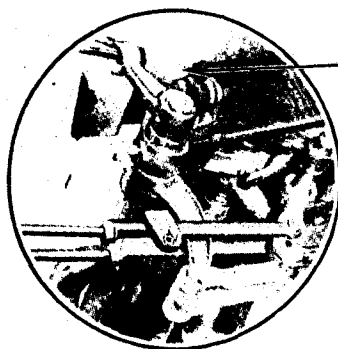


- Second type hook-up.
Use middle hole in division bar

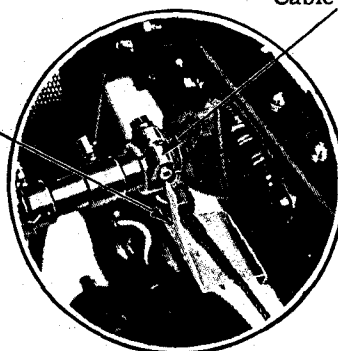
- 6 Connect rear end of pedal rod assembly to division bar



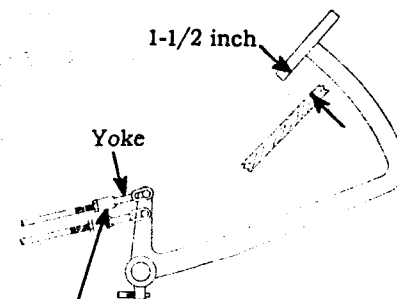
Gauge 109602



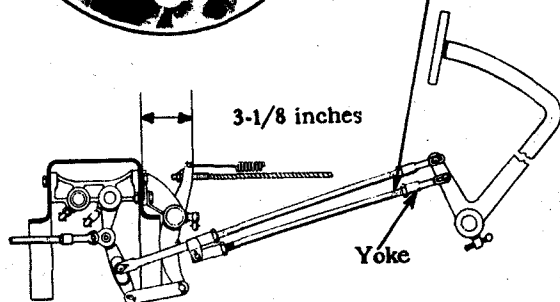
- 7 Adjust yoke on lower pedal rod to give correct position of levers on front brake cross shaft. Preferably use gauge



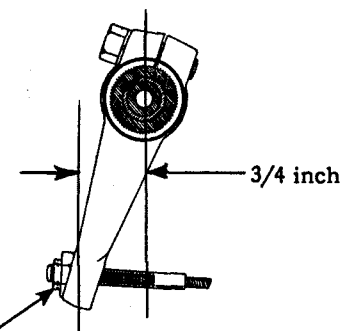
Cable lever



- 8 Adjust yoke on upper rod so second stage takes effect when pedal is 1-1/2 inches from toe board

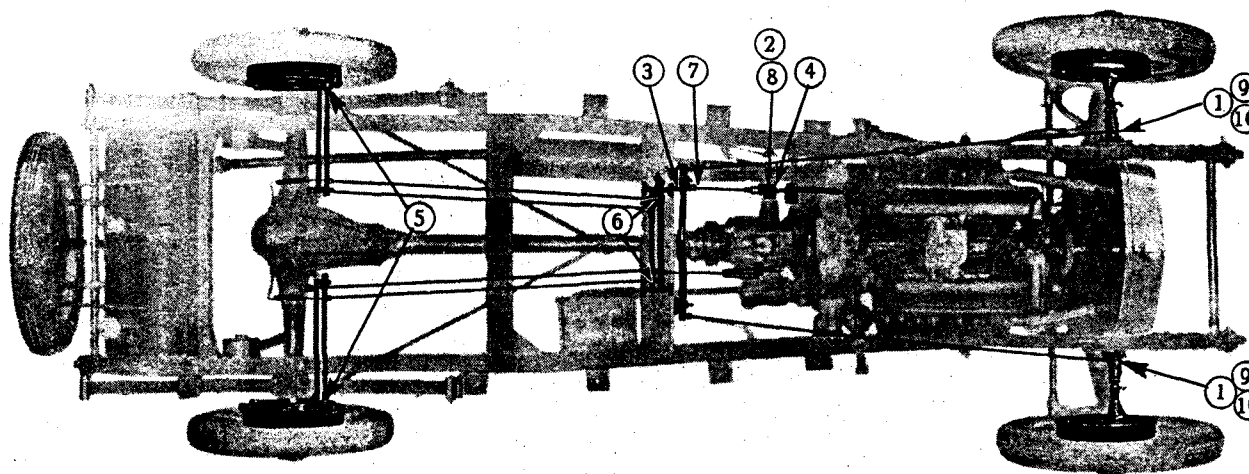


- 9 Check position of cable levers. Preferably use gauge

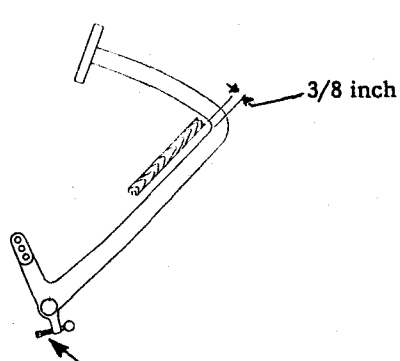


- 10 Adjust cable nuts to take up slack in cables

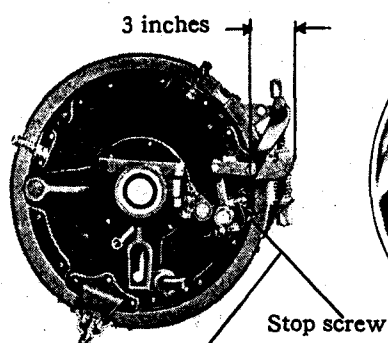
Note: Adjustment of connections must precede adjustment of bands. Connections must also be freed up before adjustment. Make all adjustments of connections in released position



- Preliminary {
- 1 Back off nuts on front ends of cables
 - 2 Disconnect pedal rod from pedal
 - 3 Disconnect division bar link

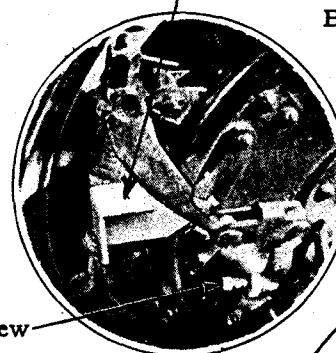


4 Adjust pedal stop screw

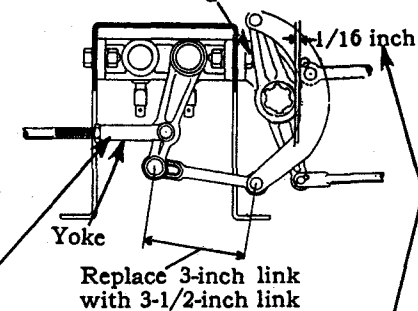


5 Adjust stop screw to give correct position of lever.
Preferably use gauge

Gauge 109419

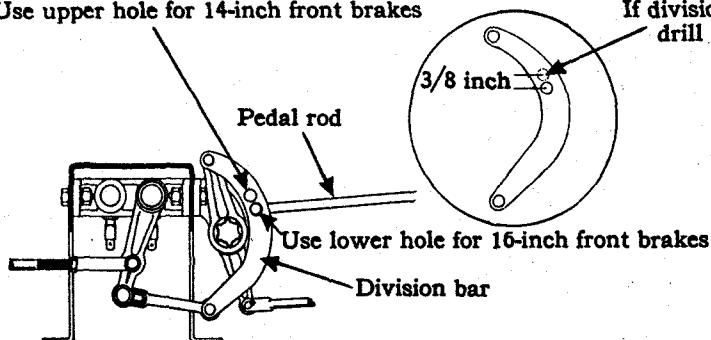


Be sure lever is back against screw head



6 Adjust yokes on rods so that division bar will clear lever on cross shaft when link is connected

Use upper hole for 14-inch front brakes

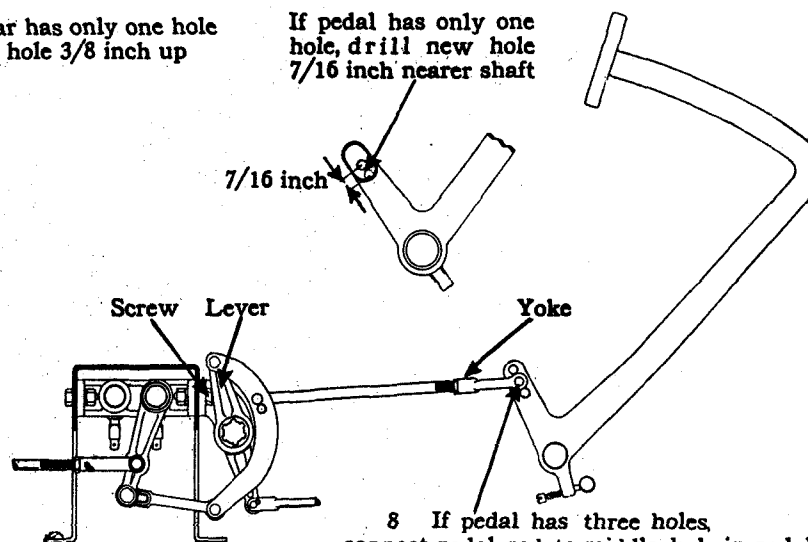


- 7 Make sure pedal rod is connected to proper hole in division bar

If division bar has only one hole drill new hole 3/8 inch up

If pedal has only one hole, drill new hole 7/16 inch nearer shaft

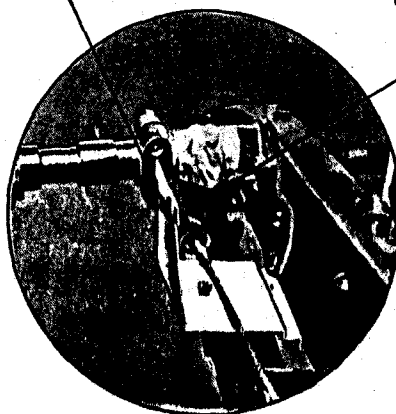
7/16 inch



- 8 If pedal has three holes, connect pedal rod to middle hole in pedal. Adjust yoke so lever clears screw in bracket

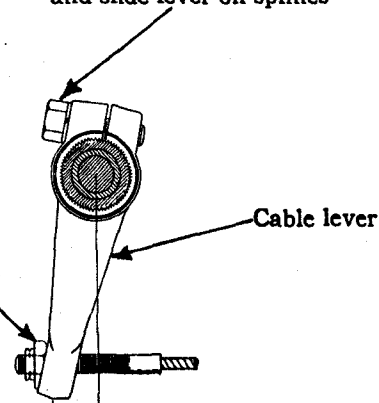
Gauge 109420

- 9 Check position of cable levers. Preferably use gauge. (Omit this step on all cars with 14-inch front brake drums and on cars with 16-inch drums which have levers welded on shaft)



- 10 Adjust cable nuts to take up slack in cables

To change position of lever, loosen clamp screw and slide lever off splines



1/2 inch in applied position (first type with cam-operated brakes)

1-1/4 inches in released position (second type with toggle-operated brakes)

Note: Unless brake connections are known to be O. K., check them as shown in Plate 13 before proceeding with band adjustments

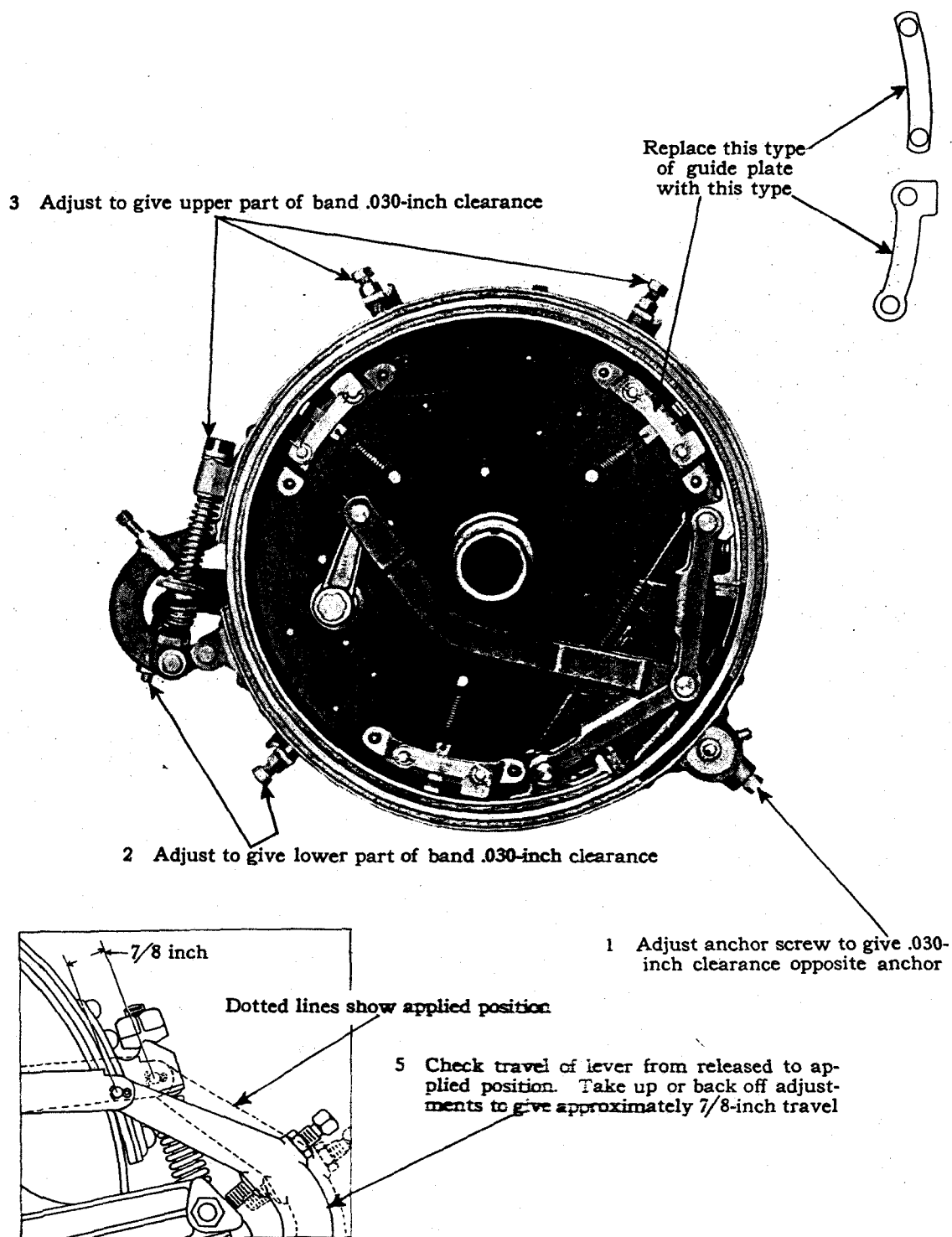


Plate 15. Adjustment of Cadillac 341-A rear foot brakes.

Note: Unless brake connections are known to be O. K., check them as shown in Plate 14 before proceeding with band adjustments

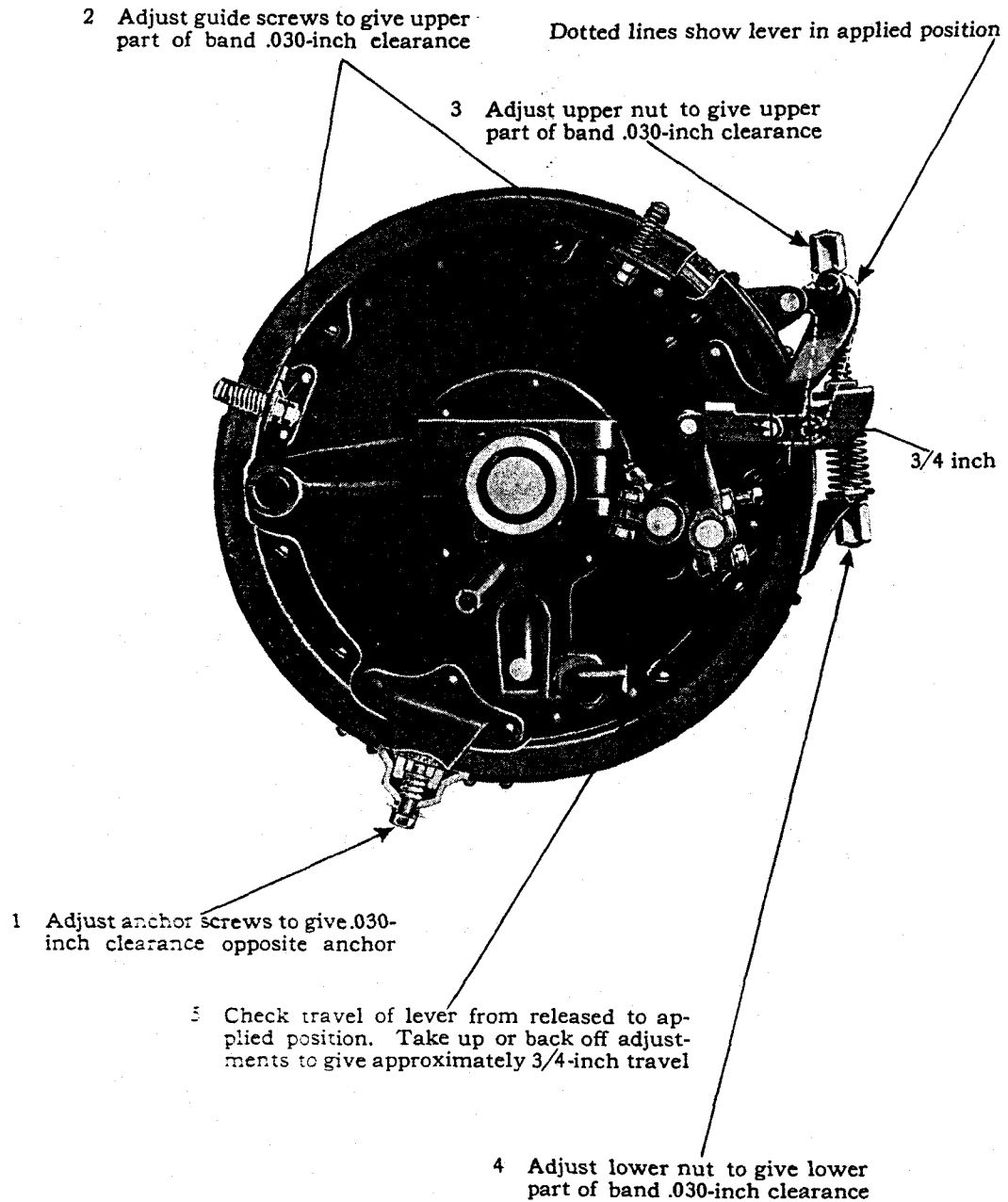
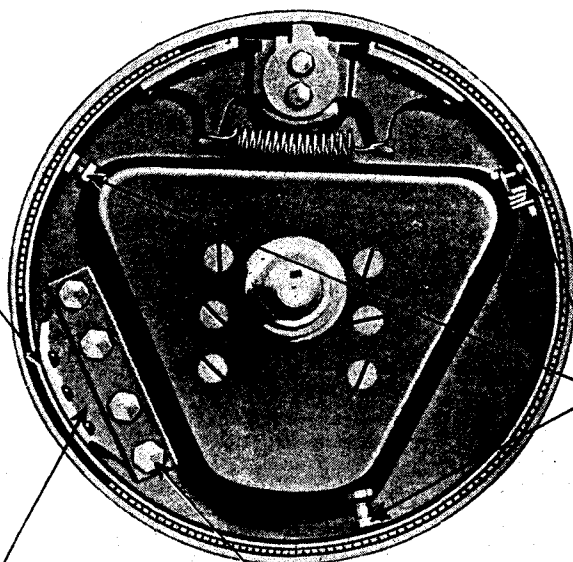


Plate 16. Adjustment of La Salle 303 rear foot brakes.

BRAKES

Note: Unless brake connections are known to be O. K., check them as shown in Plate 14 before proceeding with band adjustments

If anti-squeak is used between anchor plate and dust shield, remove and replace with thin canvas

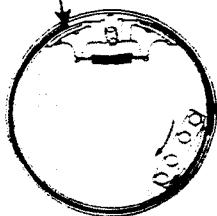


2
Adjust stop screws to give .015-inch clearance

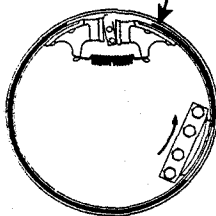
Anchor screws must be drawn tight

1 Adjust anchor in and out to give .015-inch clearance and up and down to centralize band

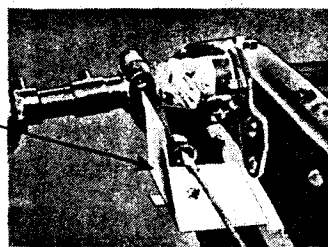
If lining stands away here, move anchor down



If lining stands away here, move anchor up

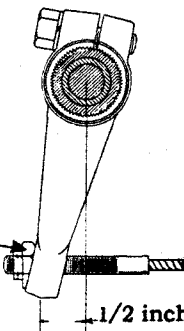


Gauge 109420



4 Check position of cable levers with brakes applied. Preferably use gauge. Change position of lever on splined shaft as necessary

3 Adjust nuts on cables to complete band adjustment and give .015-inch clearance all around



1/2 inch in applied position

Plate 17. Adjustment of La Salle 303 front brakes—first type.

Note: Unless brake connections are known to be O. K., check them as shown in Plates 13,14 before proceeding with band adjustments

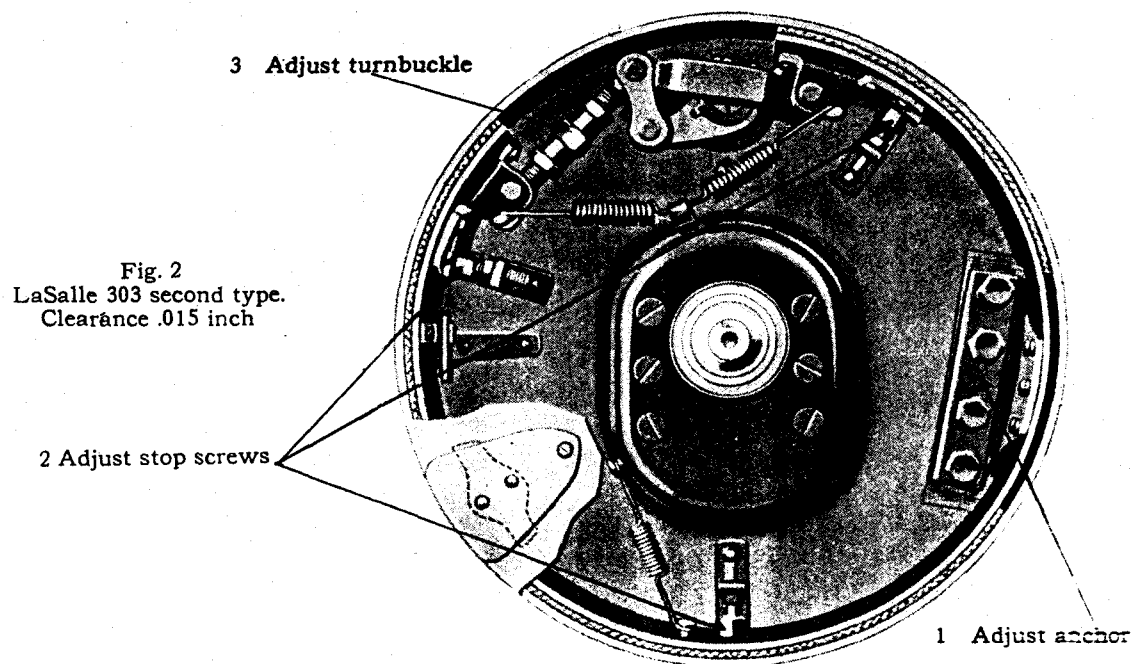
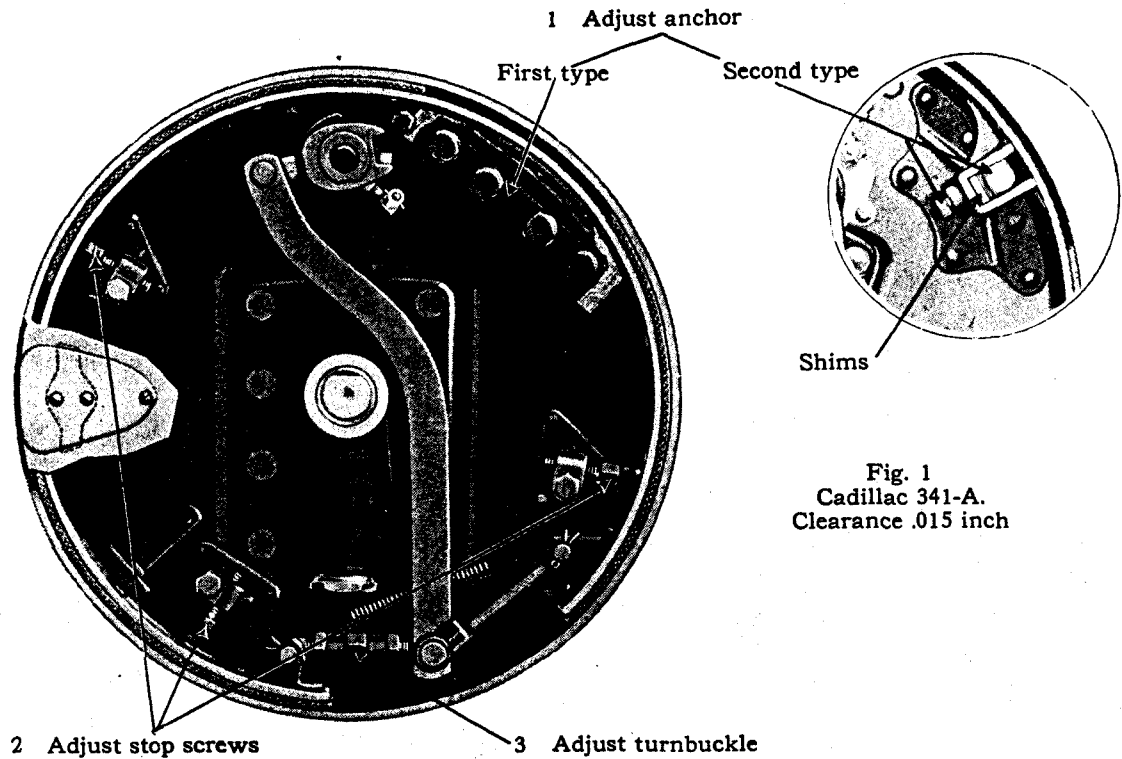


Plate 18. Adjustment of front brakes, Cadillac 341-A and La Salle 303—second type.

Clutch

Subject	Cadillac 341		LaSalle 303-328		Specifications	Remarks
PLATE TYPE						After engine unit 2-12001 on 303 cars.
Clearance between driving plates and driving pins.....	A	B	303 ²	328	New limits, .005—.008 in. Worn limit, not over .010 in.	
Clearance between hub and splines on clutch connection shaft.....	A	B	303 ²	328	New limits, .0005—.002 in. Worn limit, not over .005 in.	
Clearance between release bearing sleeve and transmission bearing cap.....	A	B	303 ²	328	New limits, .001—.004 in. Worn limit, not over .006 in.	
Clearance between release shaft and bearings in transmission case.....	A				New limits, .003—.006 in. Worn limit, not over .010 in.	
Clutch pedal, free movement..	A	B	303 ²	328	$\frac{7}{8}$ —1 $\frac{1}{8}$ in.	
Clutch spring compression...	A	B	303 ²	328	67—73 lbs. at 1 $\frac{1}{8}$ in.	
Clutch spring, number.....	A	B	303 ²	328	12	
Disc facing diameter, inside...	A	B	303 ²	328	6 $\frac{1}{2}$ in.	
Disc facing diameter, outside..	A	B	303 ²	328	9 $\frac{1}{2}$ in.	
Disc facing, number.....	A	B	303 ²	328	4	
Disc facing, thickness.....	A	B	303 ²	328	.125—.130 in.	
Disc with facings, thickness...	A	B	303 ²	328	New limits, .305—.315 in. Worn limit, not less than .250 in.	See note 1.
Release bearing.....	A ¹					
Release bearing pull-back spring, free length.....	A		303 ²		2 $\frac{1}{4}$ in., approximately	See note 2.
Release bearing pull-back spring, tension.....	A	B	303 ²	328	6—8 lbs. when stretched to 3 $\frac{3}{8}$ in. between loops	
Removal of clutch.....	A	B	303 ²	328		See note 3.
MULTIPLE DISC TYPE						Before engine unit 2-12001 on 303 cars.
Clearance between driven discs and teeth on hub. (Except rear disc).....			303 ¹		Worn limit, not over .008 in.	Fit rear disc tight on hub; next to rear disc, snug sliding fit.
Clearance between teeth on driving discs and teeth on fly-wheel. (Except rear disc).....			303 ¹		Worn limit, not over .010 in.	Rear disc, snug sliding fit in fly-wheel.
Clearance between release bearing sleeve and transmission bearing cap.....			303 ¹		New limits, .001—.004 in. Worn limit, not over .006 in.	
Clutch pedal, free movement.....			303 ¹		$\frac{7}{8}$ —1 $\frac{1}{8}$ in.	
Clutch spring, compression...			303 ¹		Not under 420 lbs. at 2 $\frac{1}{4}$ in.	
Disc facing diameter, inside...			303 ¹		6 $\frac{1}{4}$ in.	
Disc facing diameter, outside..			303 ¹		7 $\frac{1}{2}$ in.	
Disc facing, number.....			303 ¹		10	
Disc facing, thickness.....			303 ¹		.130—.140 in.	

Subject	Cadillac 341	LaSalle 303-328	Specifications	Remarks
Disc, installation of.....		303 ¹		See note 4.
Release bearing pull-back spring, free length.....		303 ¹	1½ in., approximately	
Release bearing pull-back spring, tension.....		303 ¹	6—8 lbs. at 1⅞ in. between loops.	
Thickness of driving disc with facing.....		303 ¹	Not under ⅜ in.	

1. Refacing Plate-Type Clutch

Replacement of the clutch driven discs with facings is recommended rather than refacing the original discs. The reason for this is because the surface of the facing must be ground after it is riveted to the disc, to insure the correct thickness. If the facing is too thick the disc will drag on the center plate. As it is impractical to grind the discs in service, the practice of replacing the discs and facing must be followed.

2. Clutch Release Bearing

On a few of the first 341-A cars, the clutch release bearing cannot be removed from the sleeve. If the bearing on these cars requires replacement, replace the sleeve and bearing as a unit. On later cars the sleeve has two holes through which the bearing can be reached to force it off the sleeve.

3. Removal of Plate-Type Clutch

Extreme care must be taken when removing the trans-

mission to support the rear end so as to hold the transmission in perfect alignment with the clutch until the clutch connection shaft has been pulled *all the way out* of the clutch hub.

If the rear end of the transmission is allowed to drop down or is raised too high while the clutch connection shaft is still in the clutch hub, the clutch driven discs will be sprung out of shape. *This must be avoided.*

On cars which do not have the long piloting studs on the sides of the crankcase use special studs (Tool number 109222) provided for these cars. *Plate 60 Fig 1.*

4. Assembling Multiple Disc Clutch

The rear disc in the clutch is thicker than the other discs. This plate is fitted in the clutch driver at the factory and is marked to indicate its position in relation to the driver. When re-installing the clutch, make sure the marked tooth on the driver goes between the two marked teeth on the rear disc.

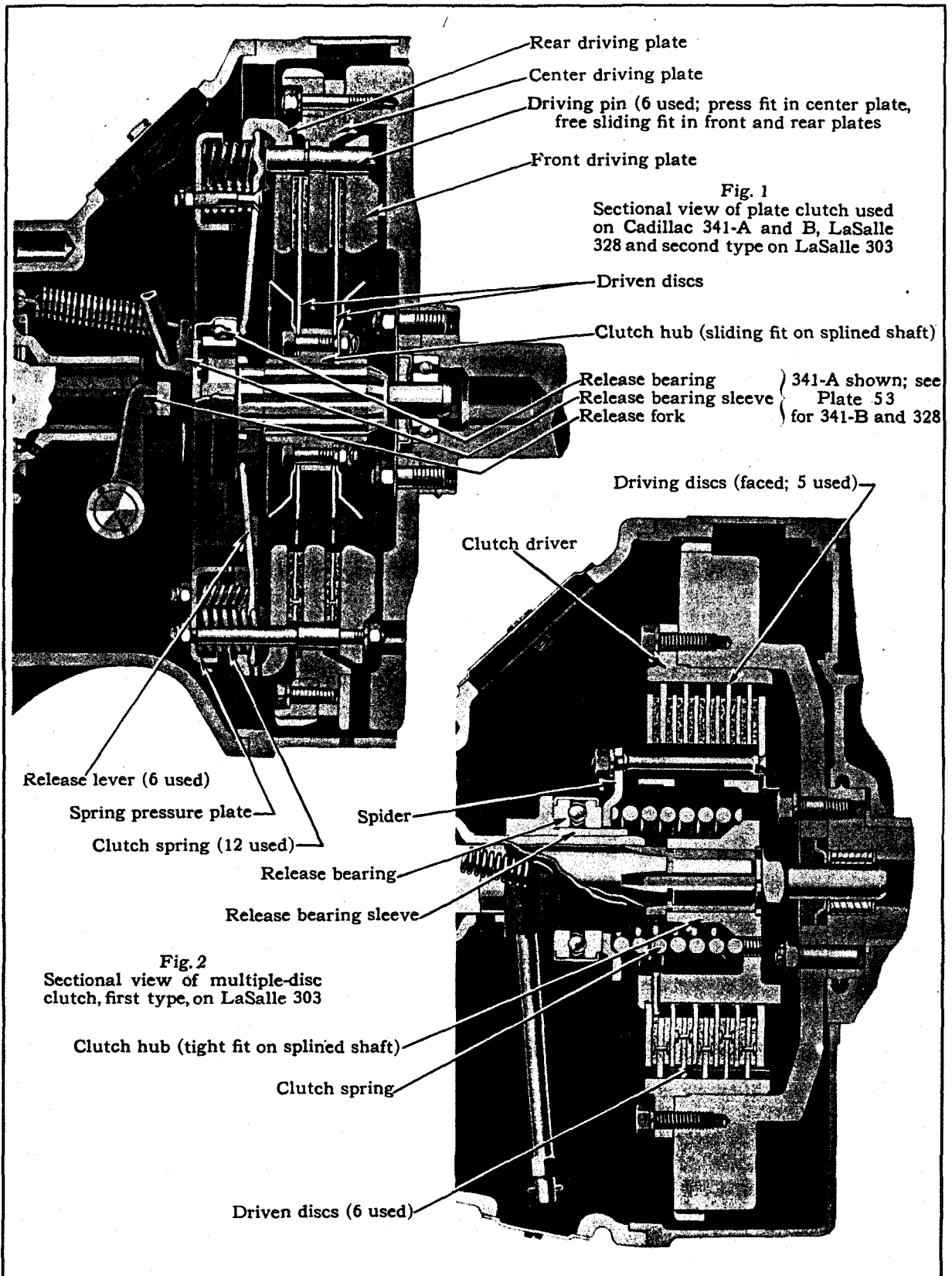


Plate 19. Sectional view of clutch.

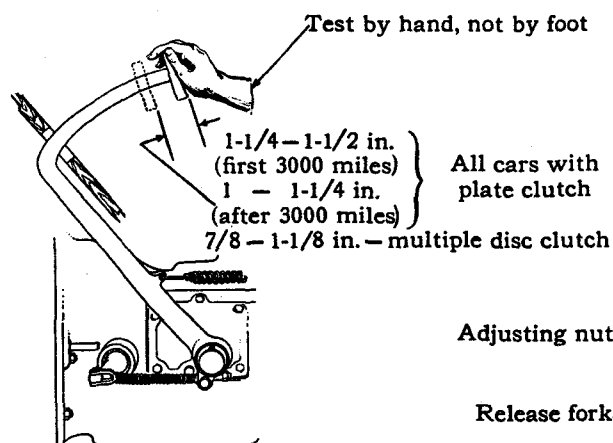


Fig. 1

Measuring free travel or lost motion of clutch pedal before starting to disengage the clutch

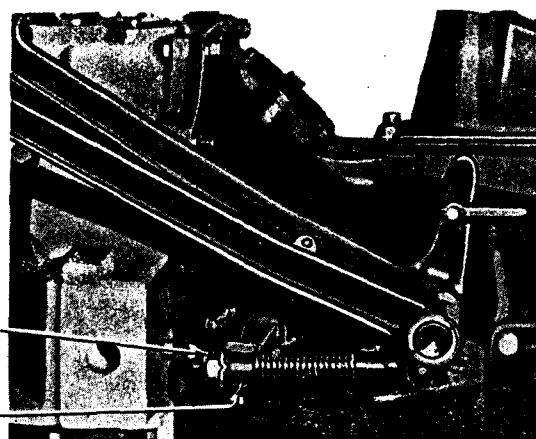


Fig. 2

LaSalle 303

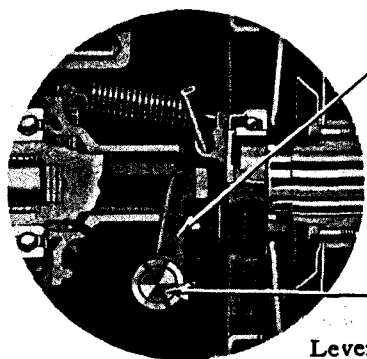
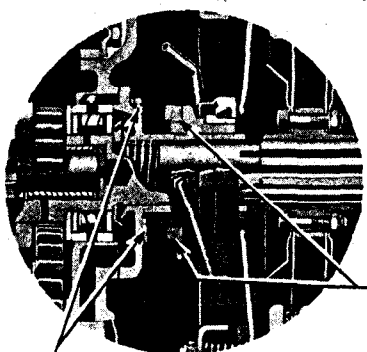
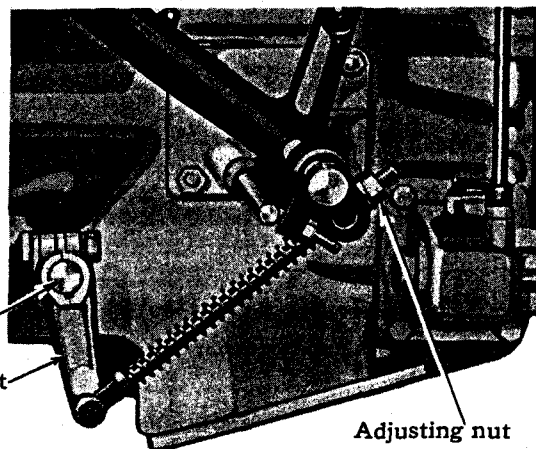


Fig. 3

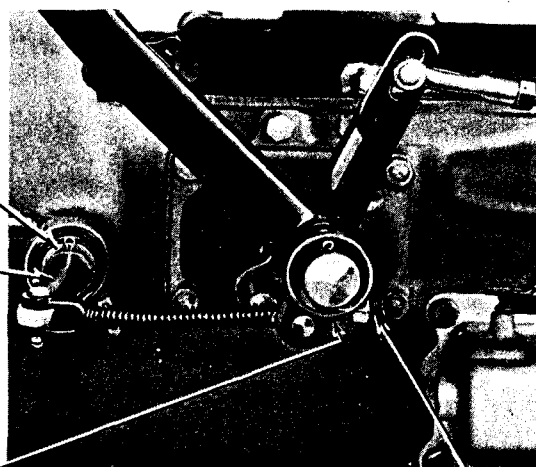
Cadillac 341-A



Install thin head cap screws (part number 871838) with special thin lock washers (part number 110730) in place of studs on 341-B cars before transmission unit 3-31617 and on 328 cars before transmission unit 4-12532. Watch for interference between studs and fork by making sure adjusting nut is tight against trunnion

Fig. 4

Cadillac 341-B and LaSalle 328



On 341-B and 328 cars the clutch release rod should be bent as shown and installed so that the bent part points up

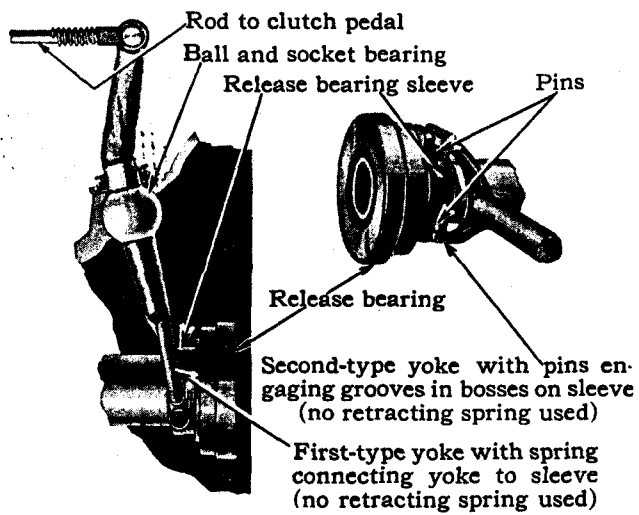


Fig. 1
Clutch release yoke on Cadillac 341-B and LaSalle 328

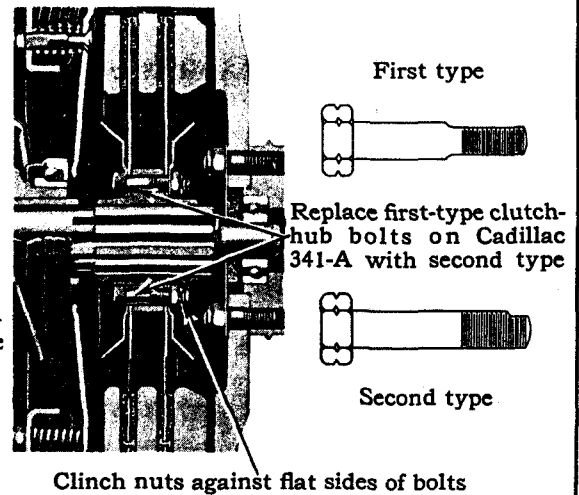


Fig. 2

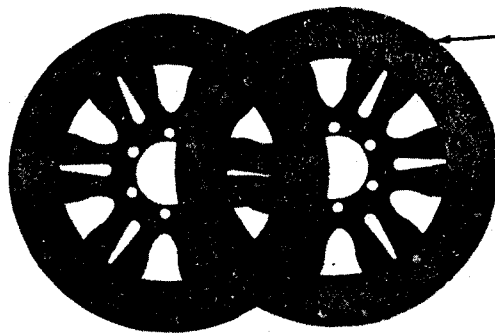


Fig. 3
Clutch driven discs with facing

To remove clutch, remove these 6 nuts
Do not touch these 12 nuts to remove or disassemble clutch or at any other time

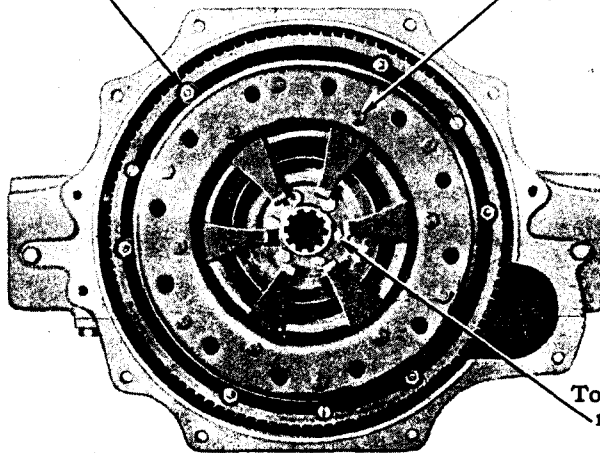


Fig. 4
Rear view of engine showing removal of clutch

Pressure plate assembly with rear driving plate. Service as a unit. Do not disassemble

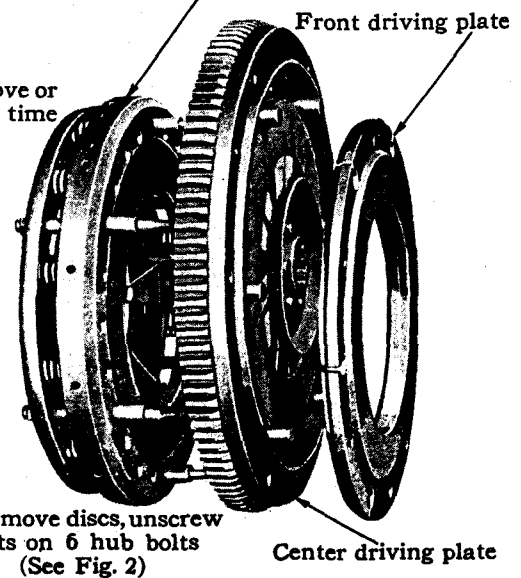


Fig. 5
Clutch disassembled

Plate 21. Removal and disassembly of plate-type clutch.

Cooling System

Subject	Cadillac 341		LaSalle 303-328		Specifications	Remarks
FAN						
Assembly, method of.....	A	B	303	328	.....	See note 1.
Bearing diameter.....	A	B	303	328	$\frac{3}{4}$ in.	
Belt, length.....	A	B	303	328	35 in.	
Belt, tension.....	A	B	303	328	$\frac{5}{8}$ in. slack with 15 lbs. pull.	Plate 22, Fig. 3.
Belt, width.....	A	B	303	328	1 in.	
Clearance between fanshaft and bushing.....	A	B	303	328	New limits, .004—.006 in. Worn limit, not over .010 in	
Diameter.....	A	B	303	.....	20 $\frac{1}{4}$ in.	When replacing fan on 303 use 21-in. fan.
Identification marks.....	A	B	.....	328	21 in.	Stamped on front face of hub cover. Fan for 328 is 21 in. in diameter. Plate 22, Fig. 5.
			.....	328	"C"	
			.....	303	"L"	
Lubrication.....	A	B	303	328	At every 1000 miles.	See note 2.
Oil capacity of fan reservoir...	A	B	303	328		See Lubrication Table, page 83
Pitch of blades.....	A	B	.....	328	33°	Cadillac 341-A Stamped "C" Stamped "L"
			.....	303	25°	
HOSE CONNECTIONS						
Cylinder to radiator hose, diameter.....	A	B	303	328	1 $\frac{1}{4}$ in.	
Cylinder to radiator hose, length.....	A	B	.....	.....	16 $\frac{3}{4}$ in.	Before engine unit 3-11595 this hose was 16 $\frac{3}{4}$ in. long. When replacing, use 16 $\frac{3}{4}$ in. hose.
			.....	303	10 $\frac{3}{4}$ in. R. H., 12 $\frac{1}{4}$ in. L. H.	
			.....	328	14 $\frac{1}{2}$ in.	
Cylinder block nipple to elbow hose, diameter.....	A	B	303	328	1 $\frac{1}{4}$ in. (either side)	
Cylinder block nipple to elbow hose, length.....	A	B	303	328	2 $\frac{1}{4}$ in. (either side)	
Pump to elbow hose, diameter.....	A	B	303	328	1 $\frac{5}{8}$ in.	
Pump to elbow hose, length.....	A	.....	303	.....	13 $\frac{3}{4}$ in.	
			.....	328	16 $\frac{5}{8}$ in.	
Radiator to pump hose, diameter.....	A	B	303	328	1 $\frac{7}{8}$ in.	See note 3.
Radiator to pump hose, length.....	A	B	303	328	12 $\frac{1}{8}$ in.	
RADIATOR						
Anti-freeze solution					Qts.	Sp. gr. at 60°F. % by Vol.
Alcohol required for 10°F...	A	B	.....	.....	7 $\frac{1}{4}$	.9668 30
			.....	303 328	6 $\frac{1}{4}$	.9668 30
Alcohol required for 0°F...	A	B	.....	.....	9	.9567 38
			.....	303 328	8	.9567 38
Alcohol required for - 10°F...	A	B	.....	.....	10 $\frac{3}{4}$	.9485 45
			.....	303 328	9 $\frac{1}{2}$	.9485 45
Alcohol required for - 20°F...	A	B	.....	.....	12 $\frac{1}{4}$	.9350 51
			.....	303 328	10 $\frac{3}{4}$	.9350 51
Alcohol required for - 30°F...	A	B	.....	.....	13 $\frac{3}{4}$	.9260 57
			.....	303 328	12	.9260 57

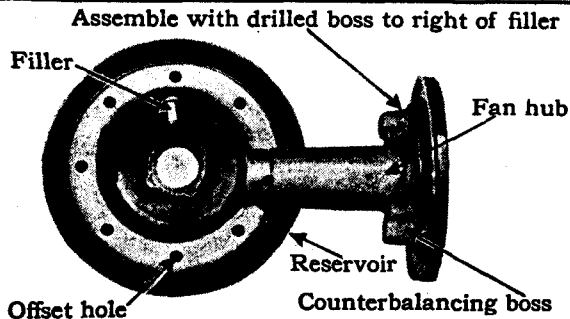


Fig. 1

To preserve balance fan hub and reservoir must be properly assembled

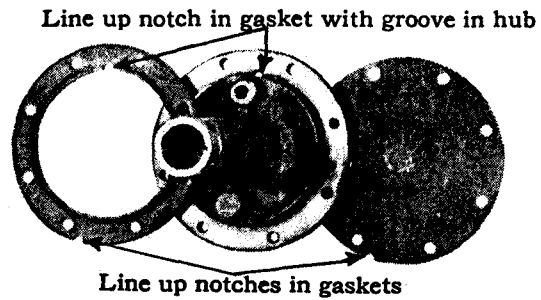


Fig. 2

Correct assembly of fan gaskets

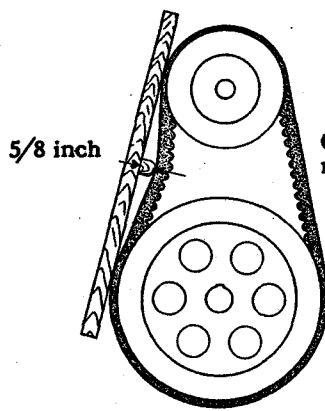


Fig. 3
Correct adjustment of fan belt

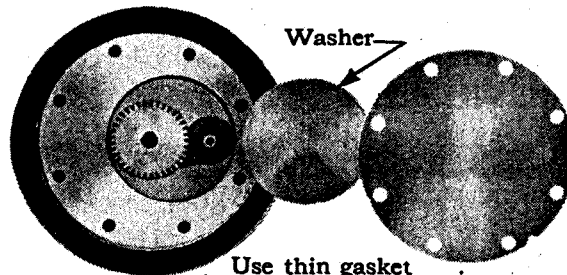


Fig. 4

Fan hub and thrust washer used on Cadillac 341-B and LaSalle 328. Use also for replacement on 341-A and 303

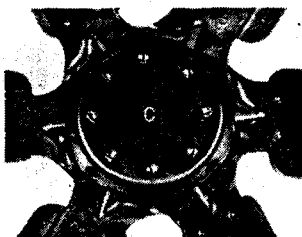


Fig. 5
Fan identification
C—Cadillac
L—LaSalle (303)

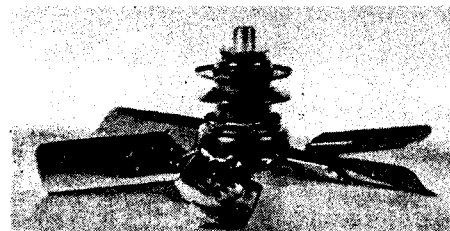


Fig. 6

Always place fan on bench with front down to prevent oil running out. Carry in same position

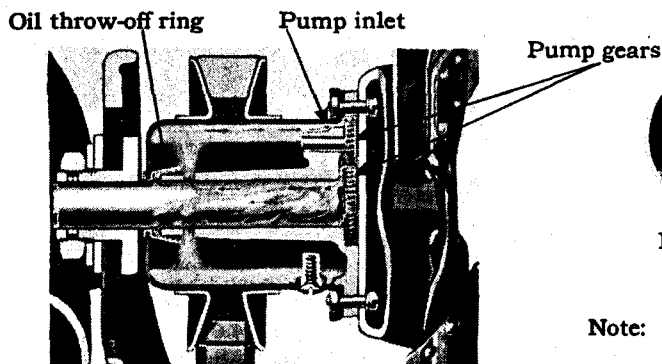
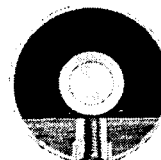


Fig. 7
Circulation of oil in fan.
Centrifugal force holds oil against outer wall of reservoir. Pump gears draw it through small hole and force it to bearing surface



Filler up for adding oil



Filler down for draining off surplus

Note: If reservoir is air-bound and surplus does not drain off at once, wait a few seconds to let air work in. Fan will throw oil if there is too much in reservoir

Subject	Cadillac 341		LaSalle 303-328		Specifications	Remarks
Capacity of cooling system...	A	B	303	328	6 gals. 5 1/4 gals.	Total capacity of cylinder water jackets, hose connections and radiator. Do not fill radiator full. This will result in overflow when the water heats and expands. Expensive when anti-freeze is used.
Flushing radiator.....	A	B	303	328	.....	See note 4.
Manufacturer's number, location of.....	A	B	303	328	Rear of upper tank—right side	
Spacing of studs.....	A				.....	See note 5.
Thermostat.....	A	B	303	328	.....	See note 6.
Shutters open.....	A	B	303	328	Start to open 155°—165°F Full open—180°F.	
Shutters close.....	A	B	303	328	165°—170°F.	
Shutter rod adjustment.....	A	B	303	328	Adjustable end 1/8 in past operating arms.	See note 7. Plate 23, Fig. 4.
WATER PUMP						
Clearance between impeller and pump body.....	A	B	303	328	New limits, .055—.065 in. Worn limit, not over .075 in.	
Clearance between drive sprocket and support.....	A	B	303	328	New limits, .003—.005 in. Worn limit, not over .010 in.	
Clearance between pump shaft and bushings.....	A	B	303	328	New limits, .001—.003 in. Worn limit, not over .006 in.	

1. Fan Assembly

The fan must be assembled correctly to prevent unbalance.

Inspection of the fan will show that the hub has two bosses (Plate 22 Fig. 1), one of which is drilled to receive the smaller pump gear. The drilled boss should take a position just to the right of the filler plug at which point the bolt holes will line up correctly. The other boss is on the opposite side of the hub and is of sufficient weight to counterbalance the small gear and drilled boss together with the filler plug in the oil reservoir.

In order to maintain the correct position of the balancing parts when assembling the fan, one of the eight bolt holes in the hub, the reservoir, the gaskets and the blades, is purposely off-set 1/8 inch. (Plate 22 Fig. 1). When assembling these parts the holes should line up correctly and under no consideration should the off-set hole be filed or elongated to enable the blades to be installed in any other position.

A further precaution in assembling the fan should be observed in the placing of the gasket. The ring type gasket has a notch on its inner circumference which must coincide with the small oil intake hole in the hub. The notches on the outer circumference of the ring type gasket and the solid gasket should also be in line. (Plate 22 Fig. 2)

On fans for 341-B and 328 cars, the hub is counterbored deeper to permit the installation of a metal plate between the oil pump gears and the gasket.

With these fans a thinner gasket should be used as it is easier to keep oil tight. On fans that do not have this metal plate the thicker gasket must be used so that it will fill in the space in front of the gears.

2: Lubrication of Fan

The only way to make sure that the fan has the proper amount of oil is to add more than enough and then turn the filler hole down and allow the surplus to drain off. (Plate 22 Fig. 8). If the surplus oil does not drain off at once, it is because the reservoir is "air-bound," and the filler hole should be left inverted for several minutes until the oil drains out. Oil should be added to the fan every 1000 miles.

3. Aligning Water Pump Hose with Radiator Connection

The holes for the screws by which the pump is attached to the sprocket support are purposely made 1/2 inch larger in diameter than the screws themselves. The reason for this is to permit the pump inlet connection to be lined up with the water outlet on the radiator, so that the hose will be as nearly in a straight line as possible.

In order to make use of this feature the pump screws should be loosened whenever the generator chain is adjusted. Then, as the sprocket support is moved, the pump will be free to align itself.

Because of the fact that the holes in the pump flange are so much larger than the screws, flat washers as well as lock washers are used under the heads of the screws. It is very important that these washers always be in place. If they are omitted, the screws will bottom against the chain housing, instead of clamping the pump to the face of the sprocket support. This would tend to pry the support away from the chain housing and cause an oil leak.

If a water pump is removed for any reason the flat washers must be reinstalled.

4. Flushing Cooling System

In order to keep the Cooling System free from an excessive accumulation of sediment and scale, it should be flushed by the reverse-flow method every 4000 miles.

To flush the system, the hose connection at the bottom of the radiator should be disconnected and the flushing hose attached to the radiator outlet. The flushing water will then be forced up through the radiator, back through the cylinder jackets and pump and out through the disconnected hose. The flushing operation should be continued until the water from the pump is reasonably clear.

The pressure of the water used in flushing the cooling system should not exceed 20 to 25 pounds as a higher pressure is liable to damage the radiator.

5. Spacing of Radiator Studs

On 341-A Cadillac cars previous to engine unit 300600 and after engine unit 301200 (these numbers are approximate), the radiator studs are 9 inches apart on centers. On cars between these two unit numbers and also on some

later 152-inch chassis, the radiator studs are 15 inches apart.

Whenever a radiator core having the studs 15 inches apart requires replacement, it will be necessary to remove the anchorage from the old core and use it with the new core to permit installing the new radiator on the chassis. To replace the anchorage, it is simply necessary to remove the two bolts which hold the anchorage on each side.

6. Operation of Thermostat

The thermostat plunger should start its stroke at a temperature of not less than 150° and should have a full stroke of $\frac{1}{4}$ inch at a temperature of not over 175°. The test may be made by placing the thermostat in water of the proper temperature.

7. Adjustment of Shutter Rod

The yoke end of the shutter operating rod should be adjusted to bring the center of the hole in the yoke about $\frac{1}{8}$ inch beyond the center of the holes in the operating arms when the rod is detached. *Plate 23, Fig. 4.*

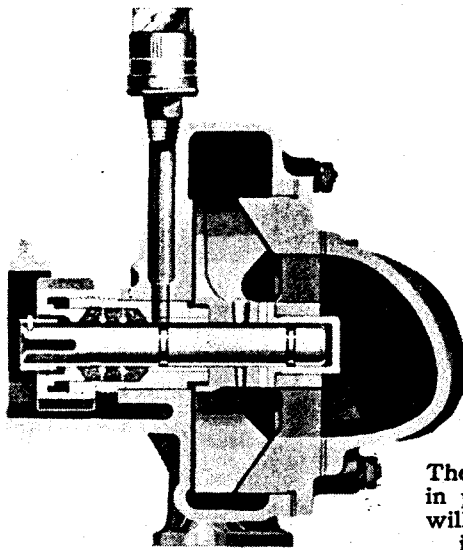


Fig. 1
Sectional view of water pump

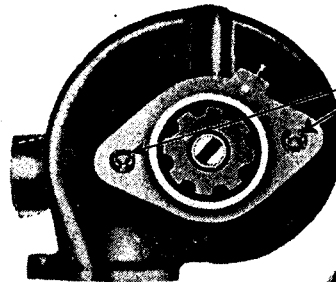
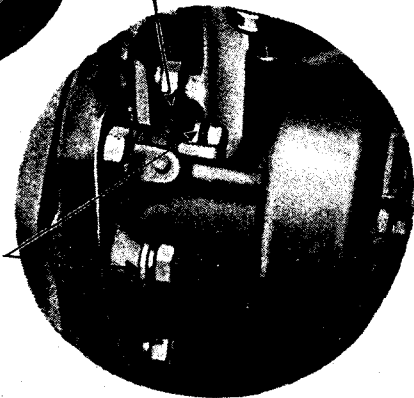


Fig. 2
Enlarged holes in water pump flange to permit lining up inlet with radiator connection



These flat washers must be in place; otherwise screws will bottom on chain housing and cause oil leak

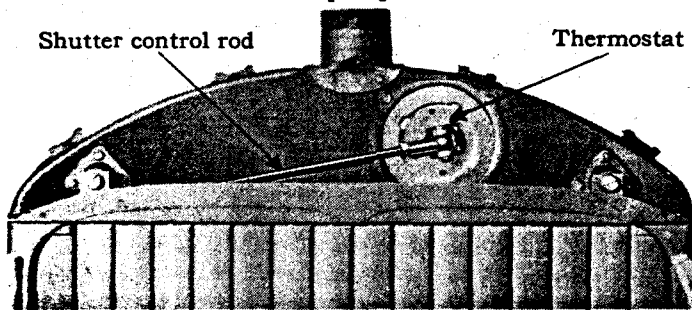


Fig. 3
Front view of radiator showing thermostat and shutter control

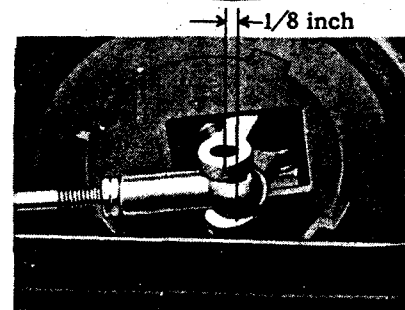


Fig. 4
Adjustment of shutter control rod

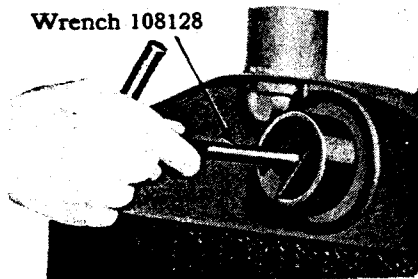


Fig. 5
To remove thermostat unscrew retaining nut

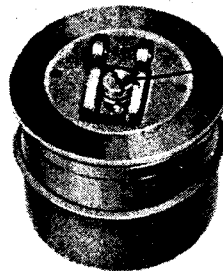


Fig. 6
Thermostat assembly. To disassemble remove trunnion screw

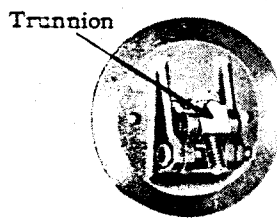


Fig. 7
Thermostat cover assembly

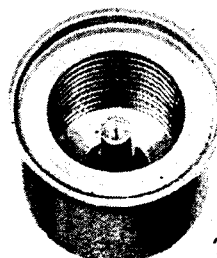


Fig. 8
Thermostat

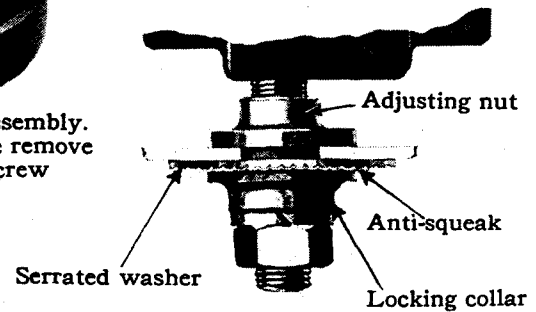


Fig. 9
Radiator support

Electrical System

Subject	Cadillac 341		LaSalle 303-328		Specifications	Remarks
Connections on gasoline tank float unit.....	A	.....	.....	.....	.....	See note 1.
Stentor phones.....	A	B	303	328	.....	See note 2.
STORAGE BATTERY						
Manufacturer's number.....	A	B	.....	.....	Exide, 3-LXRV-15-2-G Exide, 3-XC-15-1-G Exide, 3-MXV-15-1	
Capacity, rated.....	A	B	.....	.....	130 ampere hours 100 ampere hours	
Capacity, lighting.....	A	B	.....	.....	5 amperes for 26 hours 5 amperes for 20 hours	
Capacity, starting.....	A	B	.....	.....	137 amperes for 20 minutes 114 amperes for 20 minutes	
Charging rate on bench, start..	A	B	.....	.....	10 amperes 8 amperes	
Charging rate on bench, finish..	A	B	303	328	4 amperes	
Corrosion on terminals.....	A	B	303	328	.....	See Note 3.
Number of plates.....	A	B	303	328	15 plates	
Specific gravity of battery solution.....	A	B	303	328	.....	See Note 4.
Terminal grounded.....	A	B	303	328	Positive	
Voltage, rated.....	A	B	303	328	6 volts	
Water, add to storage battery..	A	B	303	328	.....	See Note 5.
CIRCUIT BREAKER						
Manufacturer's number.....	A	B	303	328	Delco-Remy 5759	
Lockout circuit breaker opens..	A	B	303	328	25-30 amperes	
Vibrating circuit breaker starts.	A	B	303	328	25-30 amperes	See Note 6.
CUT-OUT RELAY						
Manufacturer's number.....	A	B	303	328	Delco-Remy 266N	
Air gap between contacts.....	A	B	303	328	.015-.025 in.	
Air gap between cut-out armature and core.....	A	B	303	328	.014-.021 in.	This measurement is made with contacts together.
Cut-out closes.....	A	B	303	328	At 7.5 volts, approximately	Corresponding armature speed, 420 R P. M.; car speed, 8-10 M. P. H
Cut-out opens.....	A	B	303	328	At discharge of 0 to 2.5 amperes	
GENERATOR						
Manufacturer's number.....	A	B	303	328	Delco-Remy 384	
ARMATURE						
Commutator, out of round...	A	B	303	328	Not over .002 in.	
End play in ball bearing.....	A	B	303	328	Not over .015 in.	
Radial (side) play in ball bearing.....	A	B	303	328	Not over .004 in.	
BRUSHES						
Tension of brush arm springs	A	B	303	328	16-20 oz.	Test with spring scale, Tool number 100242.
Charging rate on bench—						
700 R. P. M. (cold).....	A	B	303	328	7 amperes at 7.2-7.4 volts	
1400 R. P. M. (cold).....	A	B	303	328	18 amperes at 8.2-8.62 volts	
1600 R. P. M. (hot).....	A	B	303	328	10-12 amperes at 7.3-7.7 volts	
Charging rate after thermostat opens.....	A	B	303	328	5-6 amperes, approximately	

Fig. 1
Sectional view of generator

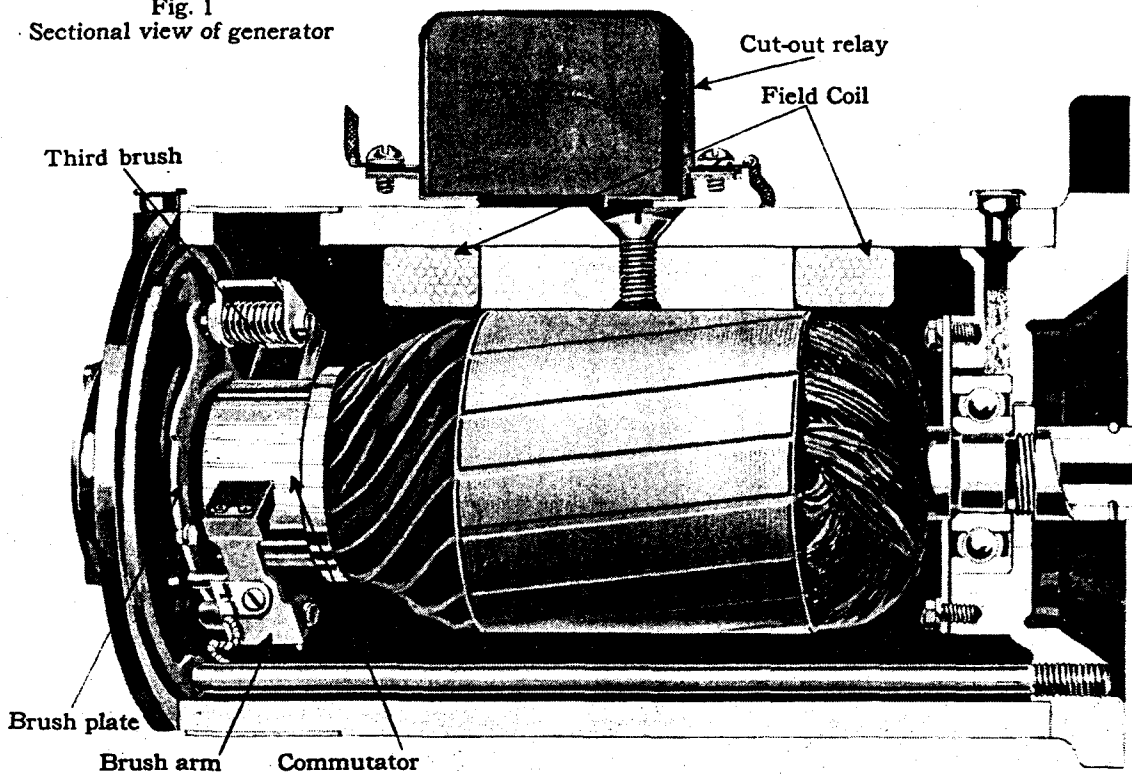


Fig. 2
Adjusting charging rate.
Pry against brush arm, not
brush. On later-type gen-
erator, pry against slot in
brush plate

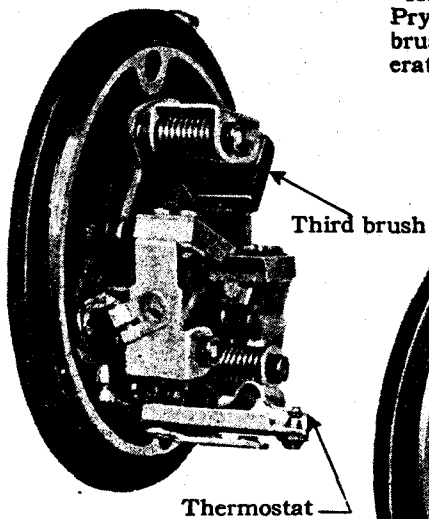


Fig. 3
End-frame of first-type
generator showing split-
pole type of thermostat

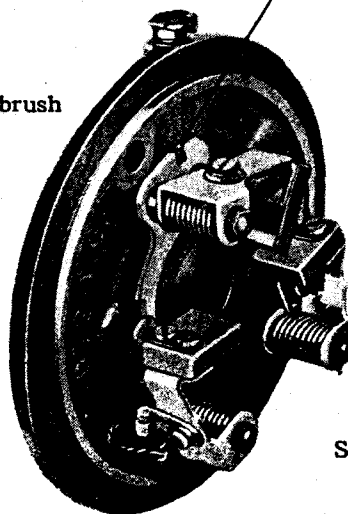


Fig. 4
End-frame of second-type generator.
Thermostat on housing instead of end-frame

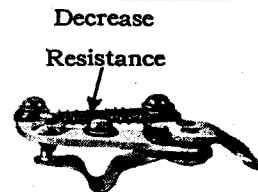
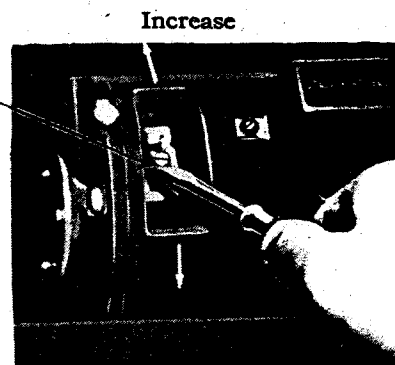


Fig. 5
Second-type thermostat with resistance

Subject	Cadillac 341		LaSalle 303-328		Specifications	Remarks
Charging rate on car.....	A	B	303	328	16-18 amperes, maximum (cold)	
Current regulation.....	A	B	303	328	Third brush (thermostat control)	Plate 24, Figs. 3, 4, 5
Running engine with storage battery disconnected.....	A	B	303	328		See Note 7
Thermostat control.....			303 ¹		Split field	Before engine unit 2-10750.
	A	B	303 ²	328	Resistance in series with field coils	Beginning with engine unit 2-10750 on 303 cars. See Note 8.
Thermostat opens.....	A	B	303	328	175° Fahrenheit	
Voltage, rated.....	A	B	303	328	6 volts	
HORN						
Manufacturer's number.....			303 ¹		Delco-Remy K25 Type C991	
	A	B	303 ²		Delco-Remy K19 Type 1050	
				328	Delco-Remy K19 Type 1053	
ADJUSTMENTS						
Air gap between armature and field core.....			303 ¹		.025 in. clearance	Adjust by loosening retaining nut and turning aluminum disc to give proper clearance. Plate 25, Fig. 1
	A	B	303 ²	328	.025 in. clearance	Adjust by loosening three stud nuts and raising or lowering field coil to give proper clearance. Plate 25, Fig. 2.
Position of vibrating spring.....			303 ¹		Horizontal	
	A	B	303 ²	328	Slight angle below horizontal	Plate 25, Figs. 1, 2.
Contact point adjustment.....	A	B	303	328	Until proper tone is secured	
Current consumption.....	A	B	303	328	7-8 amperes	
IGNITION						
Coil						
Manufacturer's number.....	A	B	303	328	Delco-Remy 2195	
Current consumption.....	A	B	303	328	2 amperes, engine stopped 2½ amperes, engine running	
DISTRIBUTOR						
Manufacturer's number.....	A		303		Delco-Remy 4023	
		B		328	Delco-Remy 4041	
Angle between contact arms.....	A	B	303	328	135°	See Note 9.
Contact point gap.....	A	B	303	328	.0225-.0270 in.	
Firing order.....	A	B	303	328	1L, 4R, 4L, 2L, 3R, 3L, 2R, 1R.	
Side play in ball bearing.....	A	B	303	328	Worn limit, not over .005 in.	
Spark advance, automatic.....	A		303		32°	
		B		328	21°	
Spark advance, manual.....	A	B	303	328	38°	
Tension of contact arm springs.....	A	B	303	328	16-20 oz.	Measure with spring scale, Tool 100242. Plate 27, Fig. 1.
Timing, low-compression cylinder heads.....	A	B	303	328	⅞ in. ahead of center, manual control advanced	See Note 10.
Timing, high compression heads.....	A		303		½ in. ahead of center, manual control advanced	
		B		328	⅞ in. ahead of center, manual control advanced	
SPARK PLUGS						
Coated with Duco.....	A	B	303	328		Clean plugs with alcohol or Duco thinner.
Gap.....	A	B	303	328	.025-.028 in.	
Type.....	A	B	303	328	A. C. Type Y	

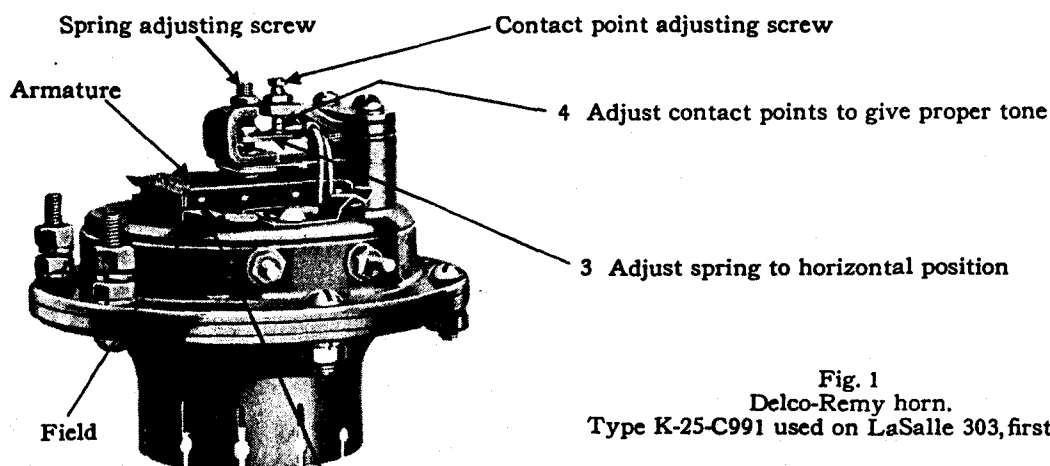
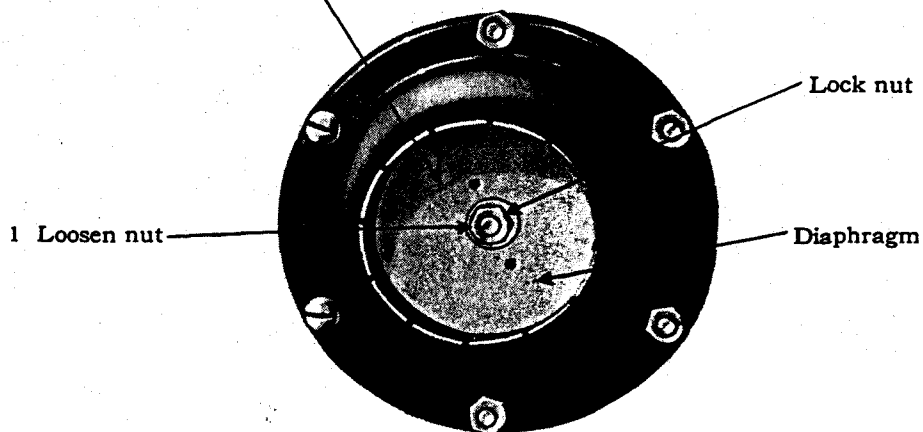


Fig. 1
Delco-Remy horn.
Type K-25-C991 used on LaSalle 303, first type

2 Turn diaphragm to give .025-inch clearance between armature and field poles



3 Adjust contact points to give proper tone

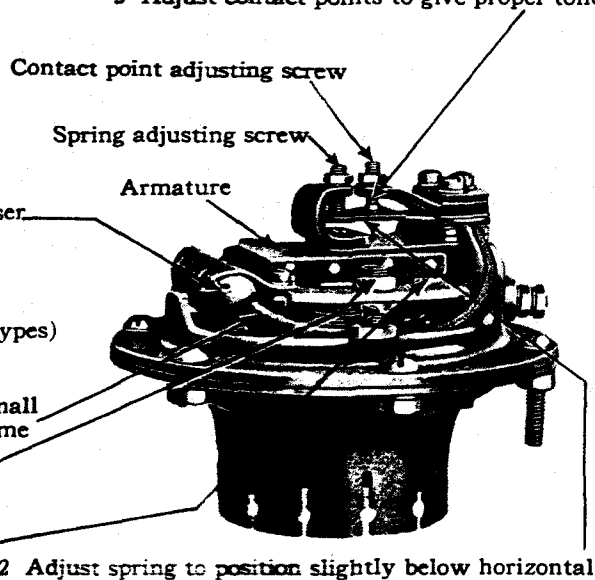
Fig. 2
Delco-Remy horn.
Type K-19-1050 used on Cadillac 341-A
and B and LaSalle 303 second type.
Type K-19-1053 used on LaSalle 328.
(The same adjustments are applicable to both types)

If condenser shorts on horn frame, place small strip of fibre between condenser and frame

Field adjusting nuts.

(4 on opposite side of armature)

1 Adjust field to give .025-inch clearance between armature and field poles



Subject	Cadillac 341		LaSalle 303-328		Specifications	Remarks
STARTING MOTOR						
Manufacturer's number.....	A	B	.....	.....	Delco-Remy 382 Delco-Remy 725-C.	
	.....	.....	303	328		
ARMATURE						
Clearance between armature shaft and bearings.....	A	B	303	328	Worn limit, not over .010 in.	
Clutch spring, free length....	A ¹	.....	303 ¹	.....	2 in., approximately	Before engine number 312924 on 341-A cars and 219923 on 303 cars.
	A ²	B	303 ²	328	2¼ in., approximately	Beginning with engine number 312924 on 341-A cars and 219923 on 303 cars.
Clutch spring, compression..	A ¹	.....	303 ¹	.....	34—38 lbs. at 1 in.	Before engine number 312924 on 341-A cars and 219923 on 303 cars.
	A ²	B	303 ²	328	46—52 lbs. at 1 in	Beginning with engine number 312924 on 341-A cars and 219923 on 303 cars.
Commutator, out of round...	A	B	303	328	Worn limit, not over .002 in.	
End play.....	A	B	303	328	Worn limit, not over .025 in.	
BRUSHES						
Number of brushes.....	A	B	.....	.....	6 4	
	.....	.....	303	328		
Tension of brush arm springs	A	B	.....	.....	36-40 oz. 24-28 oz.	Test with spring scale, Tool 100242.
	.....	.....	303	328		
Gear ratio.....	A	B	303	328	12 to 1	Ratio between starter gear and fly- wheel gear.
Number of poles.....	A	B	.....	.....	6 4	
	.....	.....	303	328		

1. Arrangement of Units in Circuit Diagrams.

The positions of the units and wires in the circuit diagrams do not always correspond to their location on the car.

For instance, the float unit of the gasoline gauge is shown in the center of the 341-A Cadillac diagram (Plate 32). When looking at the float unit from the rear of the car the green wire is connected to the right terminal, which is terminal No. 2, and the black wire to the left terminal, which is terminal No. 1.

On the diagram, however, terminal No. 1 is on the right and terminal No. 2 on the left, which makes it appear that the unit is upside down. This was done so that the wires to the float unit would not have to be crossed in the diagram. As the terminals on the car are marked with the proper numbers no difficulty should arise in properly connecting the gasoline gauge.

2. Stentor Phone Replacement.

The stentor phones in the Imperial and the Fleetwood Town Cars are matched and installed in pairs. Therefore, if the original transmitter and receiver are not kept together the operation of the phone is likely to prove unsatisfactory.

If the signals are weak when it is known that the set is properly matched, the connections should be carefully checked for looseness and the wiring tested out for possible shorts caused by staples and tacks. If, however, replacement is found to be necessary both the transmitter and receiver should be replaced.

3. Corrosion on Terminals

See that the terminals are clean and free from corrosion. The terminals and battery posts should be wiped with a cloth saturated with household ammonia or a solution of

water and bicarbonate of soda (cooking soda). These solutions will neutralize any acid that may be present on the parts to be cleaned. Therefore, do not allow any of the solution to get into the cells of the battery.

After the parts are cleaned they should be given a heavy coat of vaseline or heavy grease.

4. Specific Gravity of Battery Solution

Test the specific gravity of the battery solution with a hydrometer.

The specific gravity of a fully charged battery is 1.270 to 1.290 at 60° F. A fully discharged battery has a specific gravity of 1.150 to 1.170 and should be removed from the car for charging.

If the gravity of the battery solution is below 1.250 investigate, if possible, to determine whether or not there has been a recent temporary abnormal demand for current, such as excessive use of the lights or starter. If the low gravity is the result of a temporary abnormal demand, it is possible that the charging rate will be sufficient as it is to bring up the gravity. If the gravity is below 1.250 and there is no evidence of a temporary excessive demand for current, the charging rate should be observed and if low the necessary steps should be taken to increase it.

In any case if the gravity is below 1.225 the battery should be removed and charged.

If any battery solution has been spilled or leaked from the cell it should be replaced with a freshly mixed solution and the battery given an over-charge by charging it from an outside source.

CAUTION: In mixing the acid solution be sure to pour the acid slowly into the water. Do not pour the water into the chemically pure acid.

5. Adding Water to Storage Battery

In winter it is sufficient to inspect the level of the battery solution every 1000 miles when the car is lubricated. In summer, however, the battery solution should be inspected every 500 miles or at least every two weeks. Enough water should be added to keep the level of the solution above the tops of the plates and even with the bottom of the filling tubes.

Water for filling the battery must be pure. Distilled water, melted artificial ice or fresh rain water are suitable for this purpose. Do not use water that has come in contact with any metal.

6. Adjustment of Circuit Breaker

The circuit breaker is of the lock-out and vibrating type, the same as on previous cars. The lock-out side protects the horn, inspection lamp, dome lamp, quarter lamps, stop lamp, step lamps and cigar lighter. In case of a ground in any of these circuits, the breaker opens and remains open until the ground is removed.

The remaining lamps including the headlamps are protected by the vibrating circuit breaker. In case of a ground in any of the circuits protected by the vibrating circuit breaker, the breaker will start to vibrate and will continue until the ground is removed.

When 32 candle power bulbs are used in the headlamps the initial rush of the current when the lamps are first turned on sometimes causes the circuit breaker to vibrate a few times. This is only a temporary overload and should not necessitate any adjustments on the circuit breaker.

7. Running Engine with Storage Battery Disconnected

Serious damage will be done to the generator if the engine is run with the battery disconnected unless the generator terminal is grounded. This can be done by using a short wire attached at one end to the front terminal of the cut-out relay and at the other end fastened under one of the cut-out hold-down screws.

8. Generator Thermostat Control

Before engine unit 2-10750 on 303 cars, the generator is of the split-field type, thermostatically controlled. One of the field coils is connected between the third brush and one of the main brushes in the usual manner. The other field coil is connected between the two main brushes and the thermostat is in series with this field. The function of the thermostat is to disconnect this field from the ground as soon as the generator reaches the temperature of 175°F.

Before the thermostat operates, both fields are in use and the out-put of the generator is correspondingly higher. When, as a result of the combined heat of the generator and the engine, the temperature reaches the predetermined point, the thermostat cuts out the field to which it is connected and the generator out-put is reduced.

Beginning with engine unit 2-10750 on 303 cars, both field coils are in series with the thermostat which in turn is in parallel with a resistance. When the thermostat operates, the entire field current is shunted through this resistance with a corresponding reduction of current out-put.

9. Contact Point Adjustment

There are two sets of contact points, one for the odd-numbered cylinders (1-3-5-7), the others for the even-numbered cylinders (2-4-6-8). The contact arm for the odd-numbered cylinders is mounted on a stationary plate and the ignition for these cylinders is timed by adjusting the cam. The contact arm for the even-numbered cylinders is at an angle of 135° from the other arm and is mounted on a plate which is adjustable for timing these cylinders. The complete timing operation should include both adjustments.

10. Timing Marks

A few early 303 cars have the IG/A mark stamped $1\frac{1}{4}$ inch ahead of dead center instead of $\frac{1}{8}$ inch. On these cars the IG/A marks should be disregarded and the timing should be set $\frac{1}{8}$ inch ahead of the dead-center marks.

Fig. 1
Top view with head and rotor removed

Contact point gap. Adjust to .025 inch for ordinary work; not less than .020 inch for high speeds

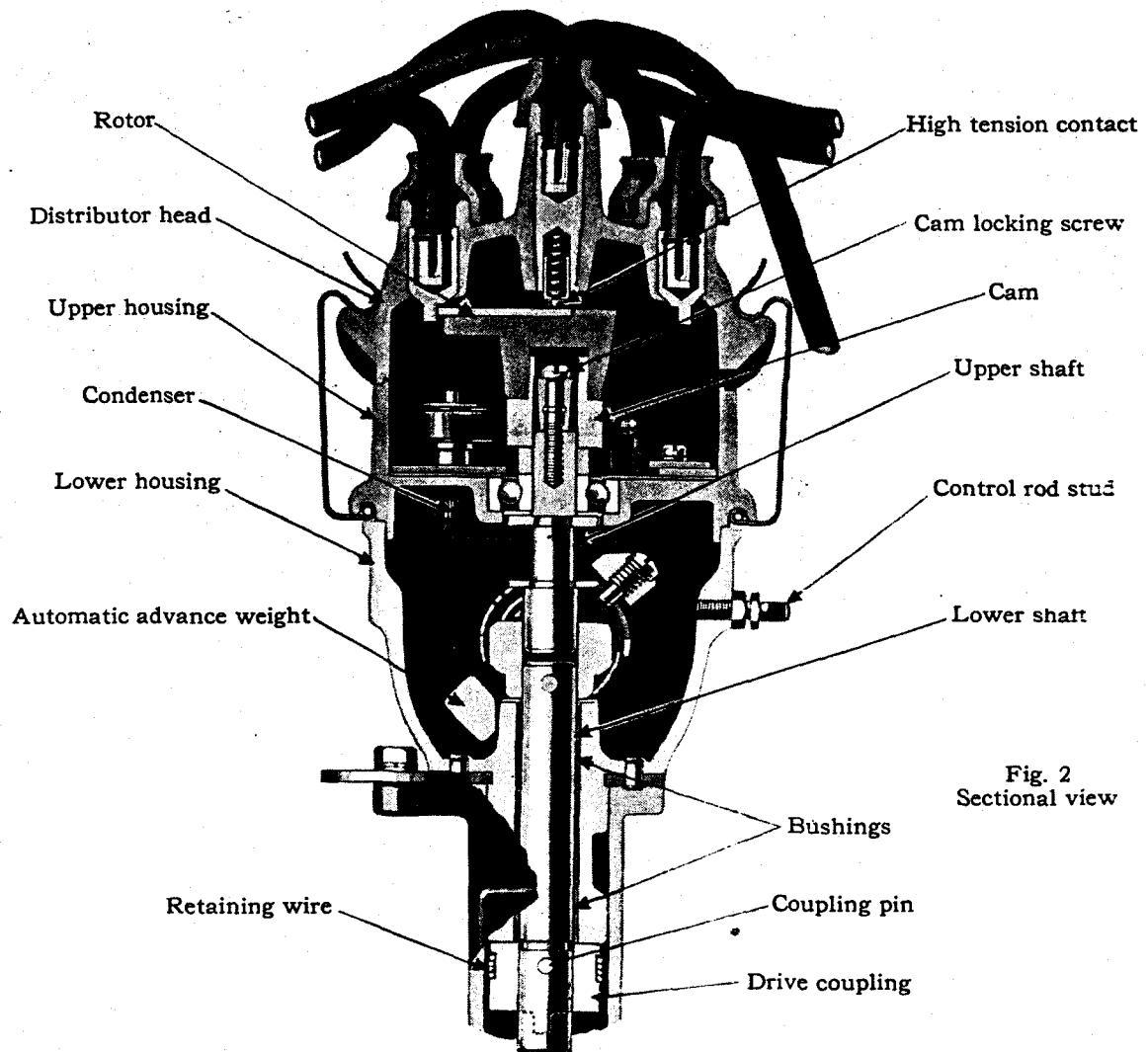
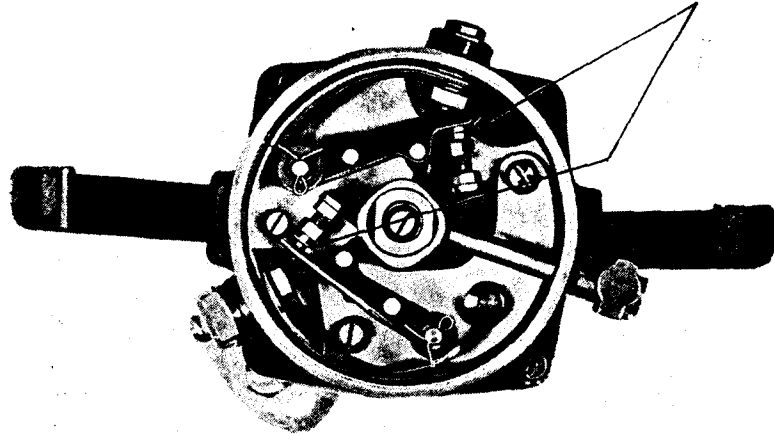
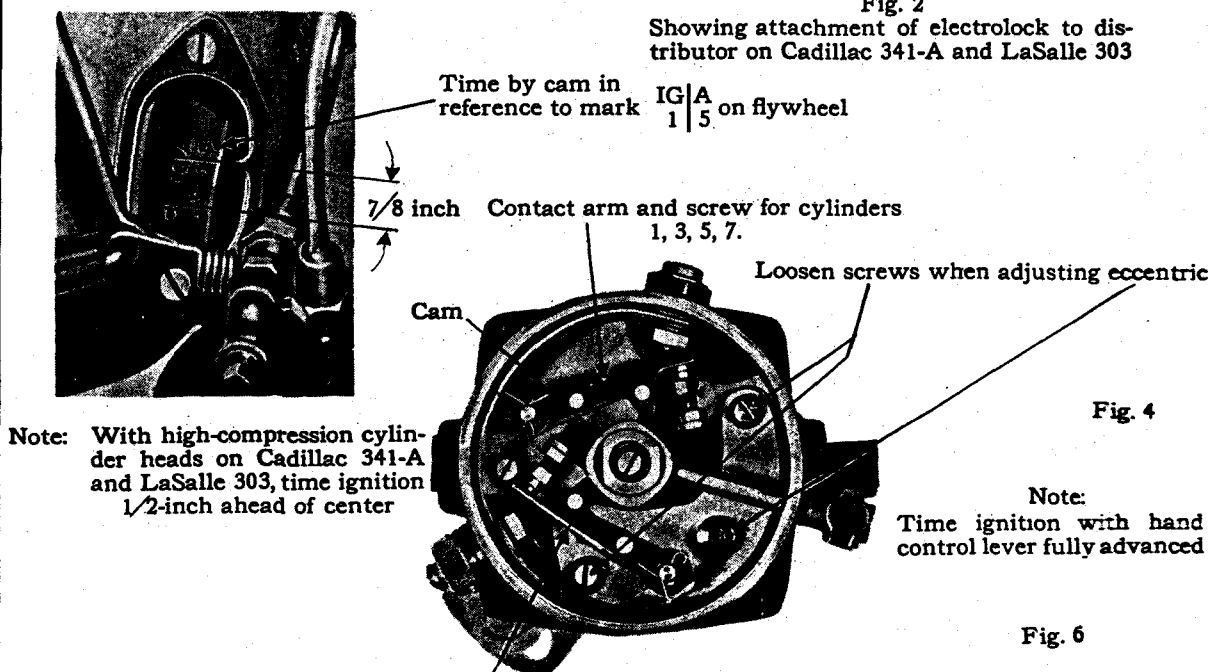
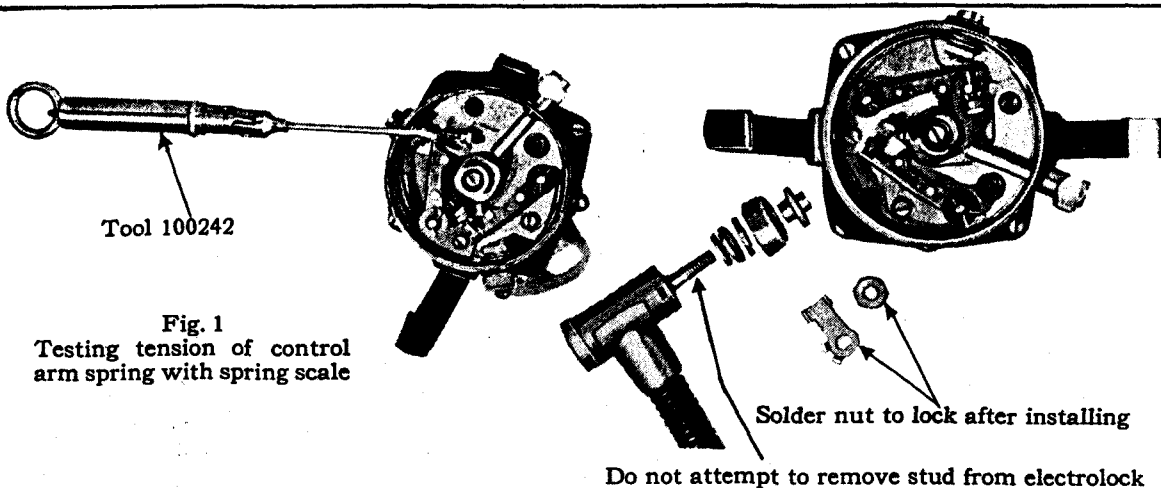


Fig. 2
Sectional view

Plate 26: Sectional and Top Views of Distributor.



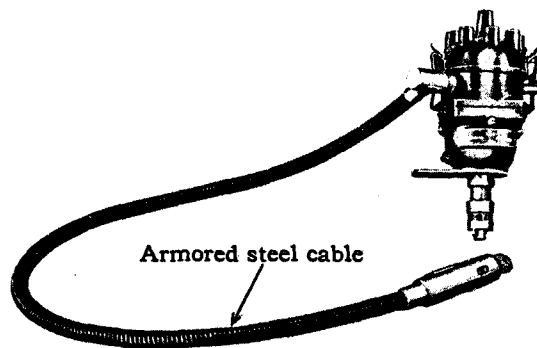


Fig. 1

Electrolock used on Cadillac 341-A and LaSalle 303
For service on distributor, remove Electrolock with
distributor or use fixture shown in Plate 27, Fig. 6

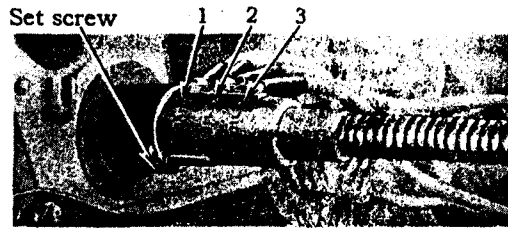


Fig. 2

Electrolock from front of instrument board.
To remove, unlock and take out set screw

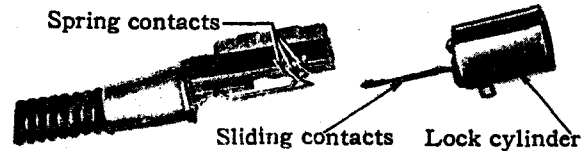


Fig. 3

Electrolock switch with casing and cylinder removed

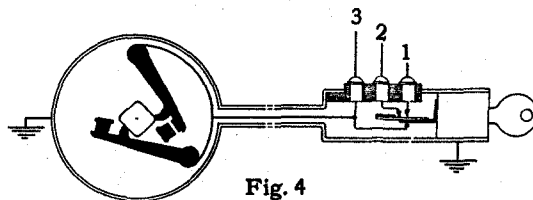


Fig. 4

Electrolock locked.
No current flowing to coil.
Coil and distributor grounded

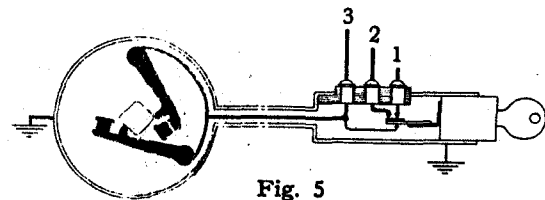


Fig. 5

Electrolock unlocked.
Terminals 1 and 2 connected by contact on
slide. Heavy line indicates flow of current

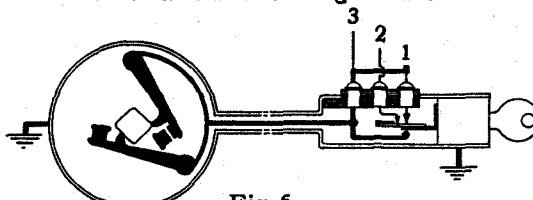


Fig. 6

Never attempt to wire around the Electrolock
A "jumper" between terminals 1 and 3 will cause
a short, damaging both switch and distributor

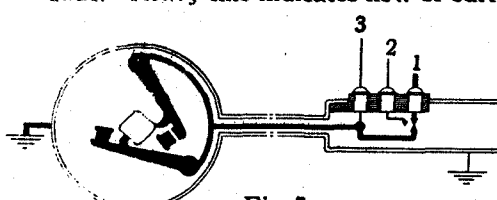


Fig. 7

Never remove the lock cylinder without disconnect-
ing the feed wire. No. 1 contact will touch the
lower contact and short through the distributor

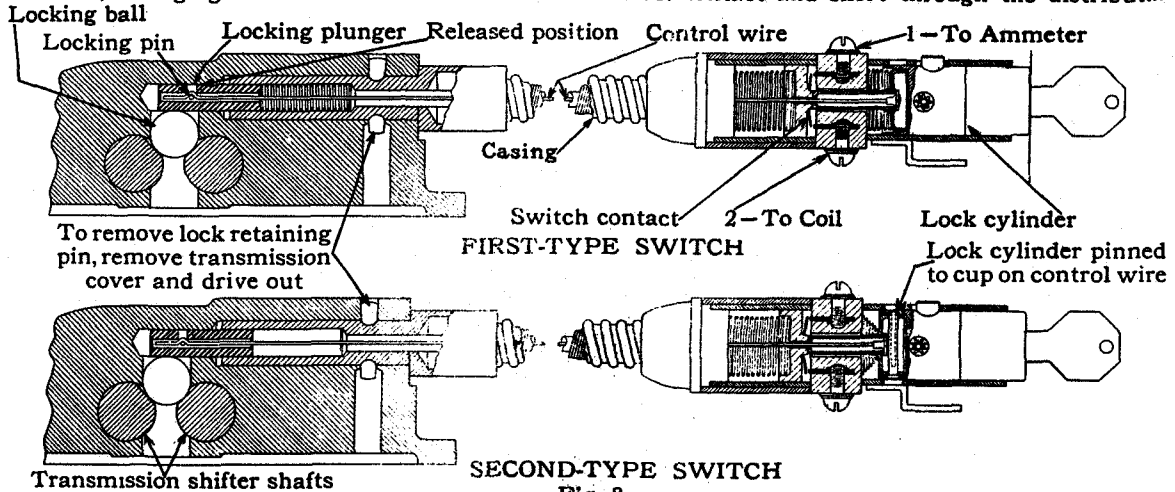


Fig. 8

Transmission lock and ignition switch on Cadillac 341-B and LaSalle 328

Plate 28. Electrolock and dual ignition and transmission lock.

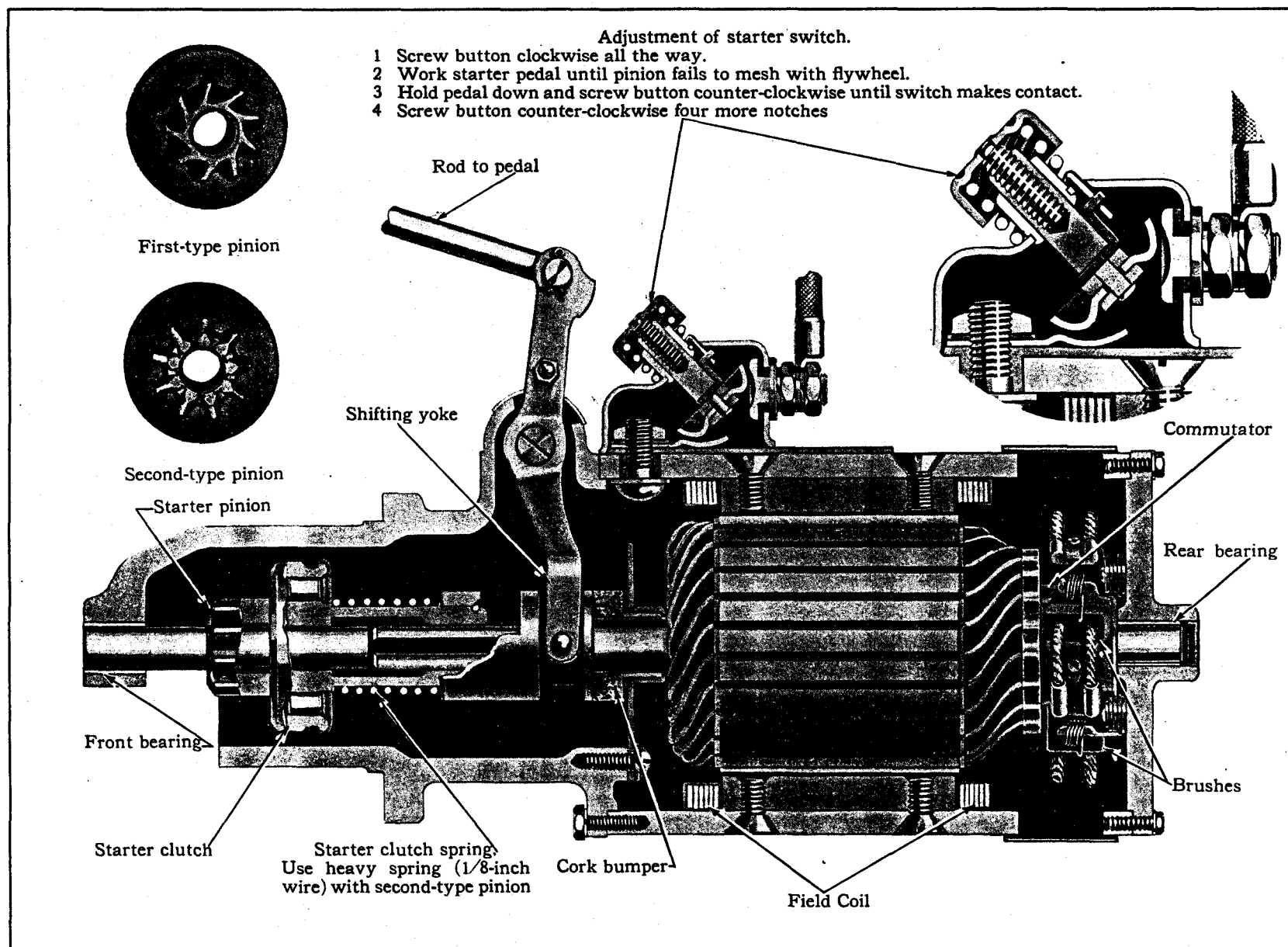
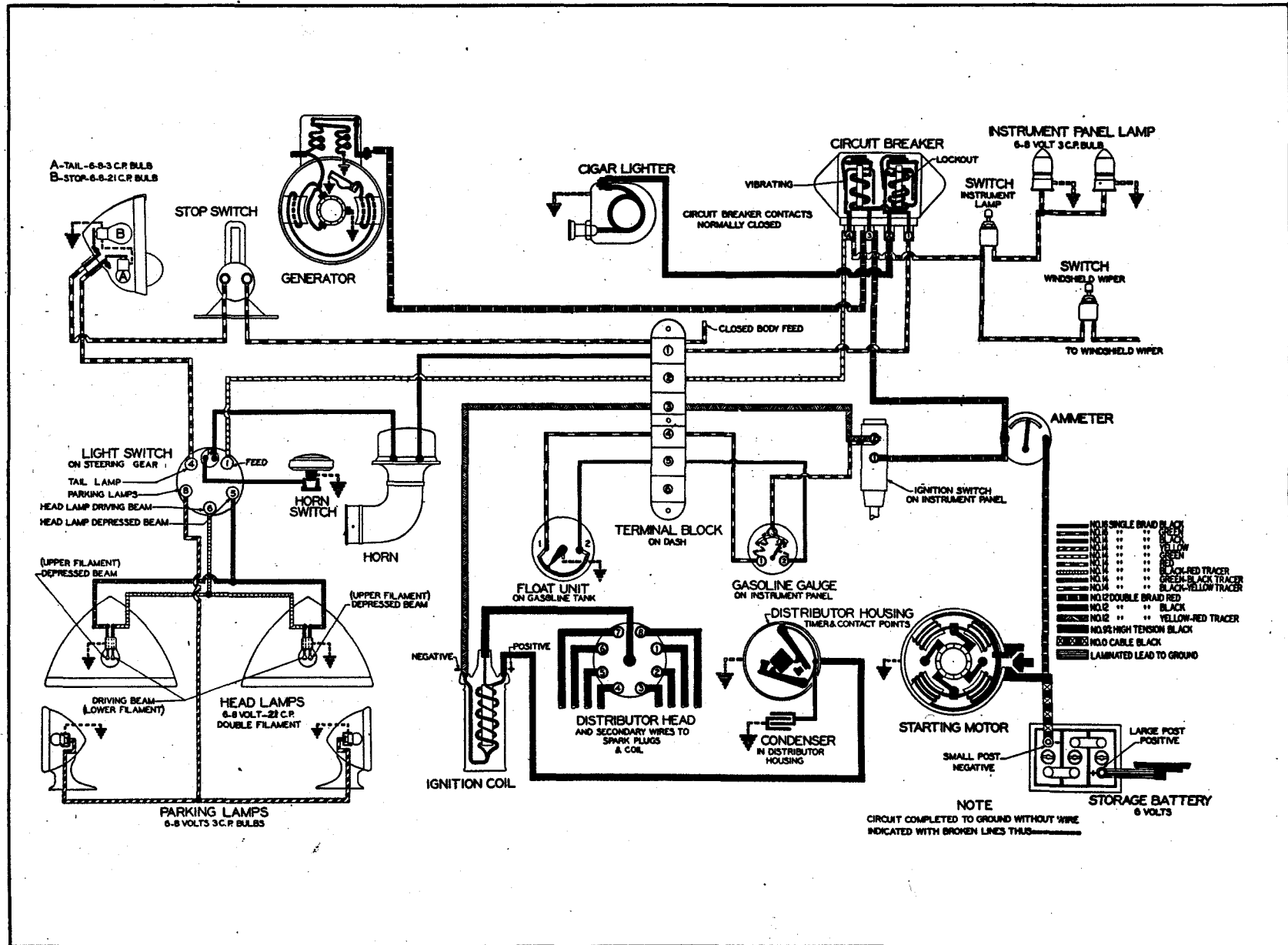


Plate 29. Starting motor details.



NOTE
CIRCUIT COMPLETED TO GROUND WITHOUT WIRE
INDICATED WITH BROKEN LINES THIS-----

Plate 31. Circuit diagram, La Salle 328.



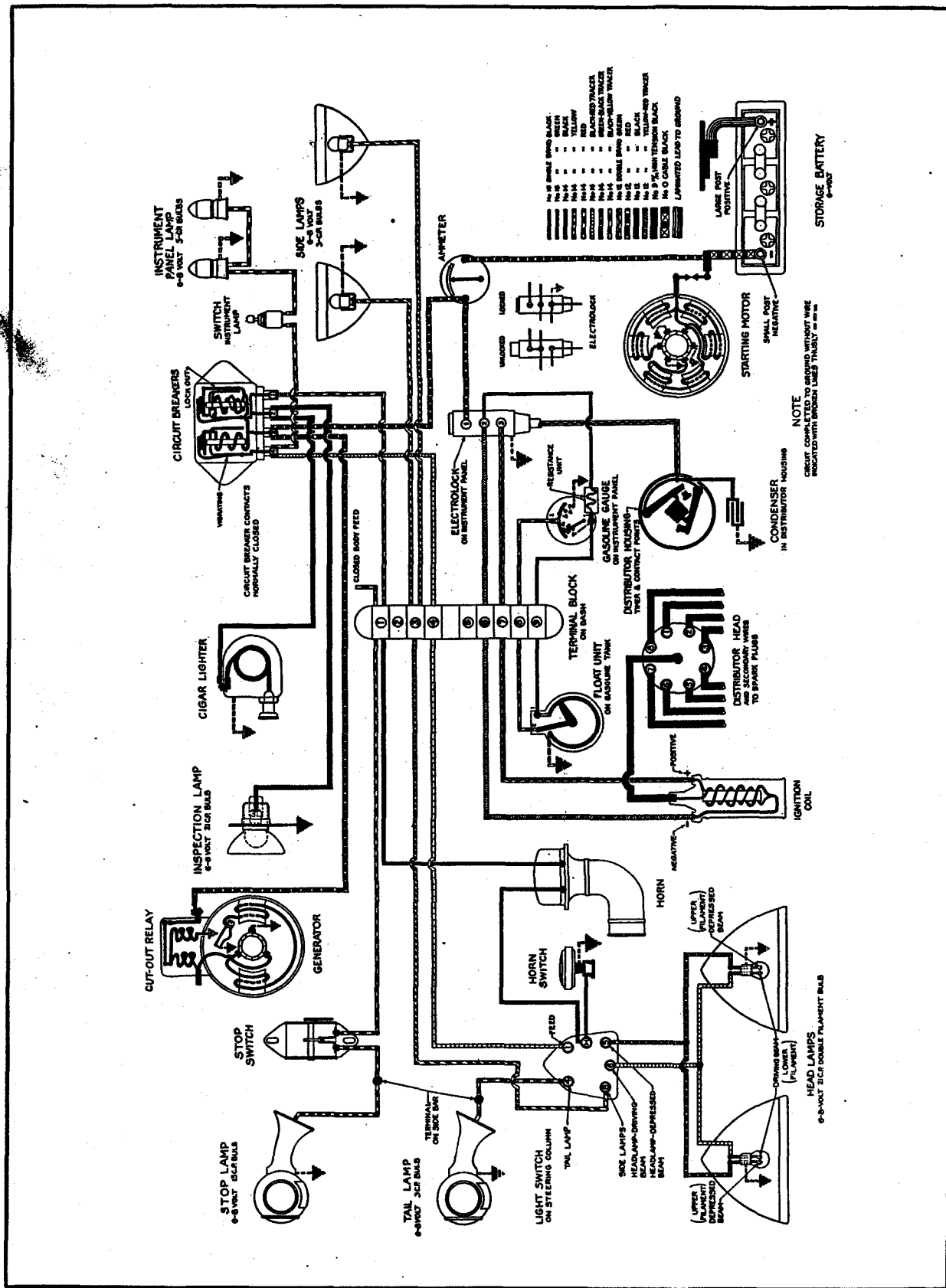


Plate 32. Circuit diagram, Cadillac 341-A.

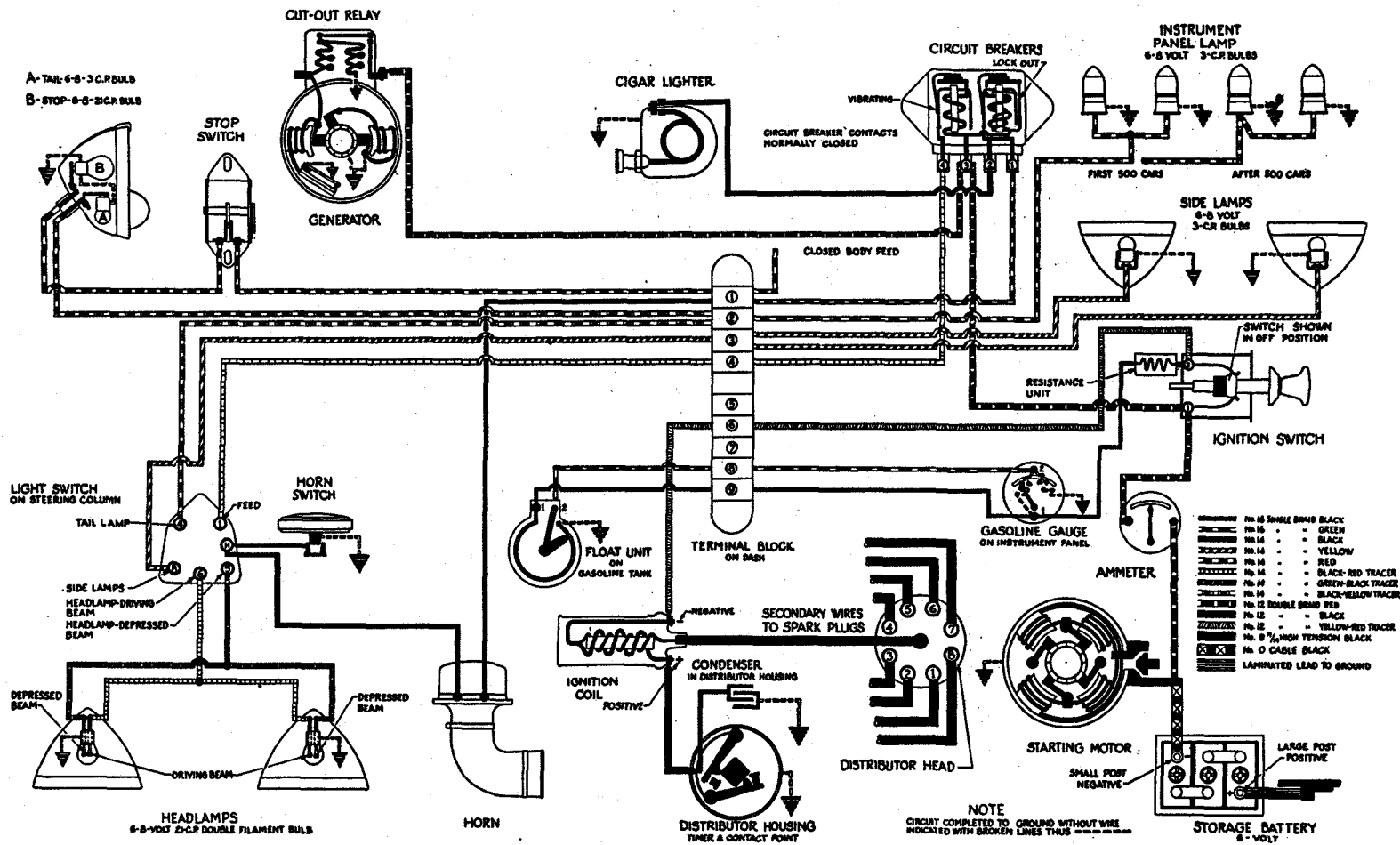


Plate 33. Circuit diagram, La Salle 303—first type.

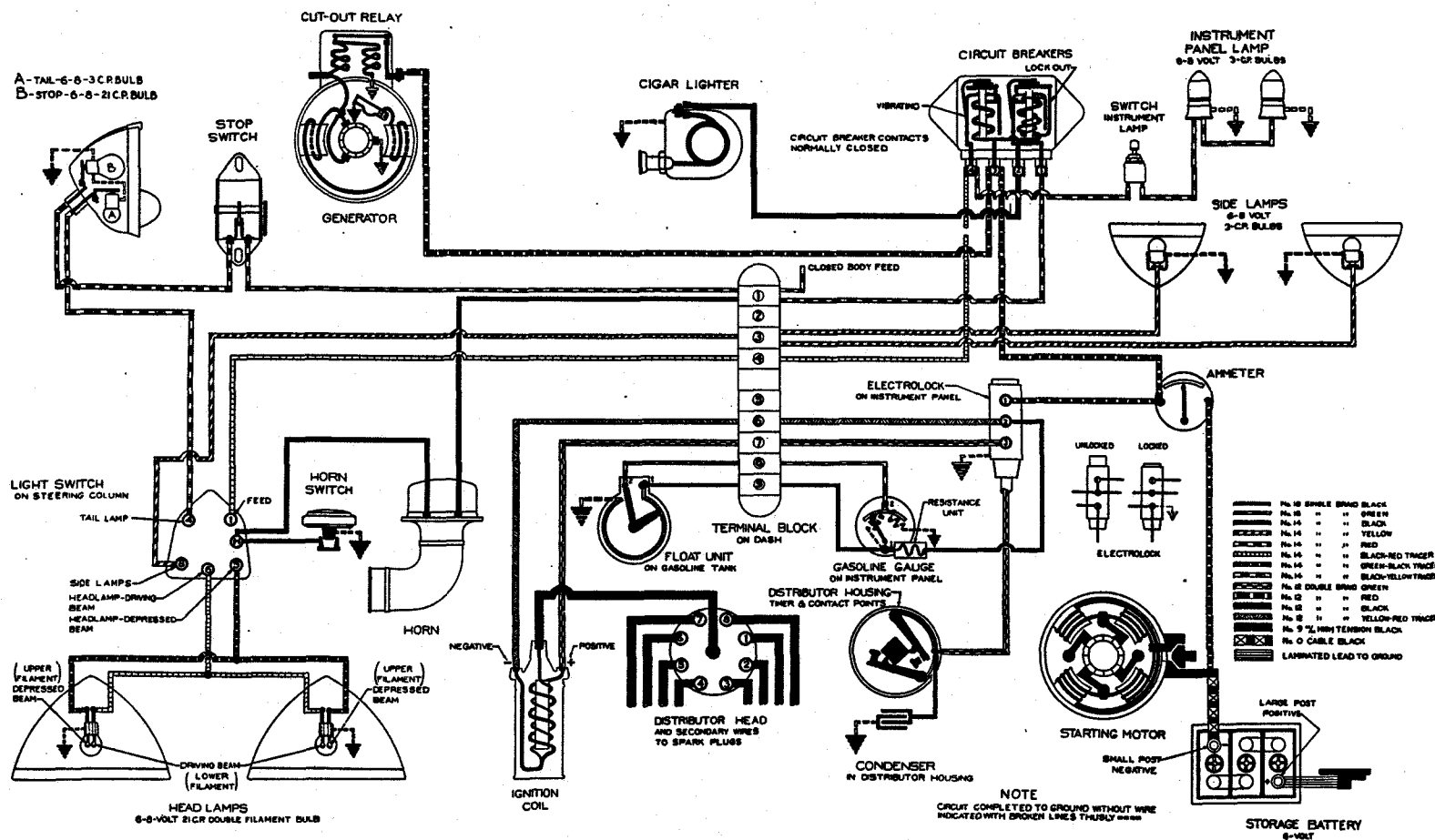


Plate 34. Circuit diagram, La Salle 303—second type.

Engine

Subject	Cadillac 341		LaSalle 303-328		Specifications	Remarks
Bore.....	A	B	.....	.....	3 $\frac{1}{8}$ in. 3 $\frac{1}{8}$ in. 3 $\frac{1}{8}$ in.	
Compression—						
Average compression pressure, low-compression cylinder heads.....	A	B	303	328	90-92 lbs. per sq. in. at 1000 R. P. M.	At the elevation of Detroit.
Average compression pressure, high-compression cylinder heads.....	A	B	303	328	105-107 lbs. per sq. in. at 1000 R. P. M.	
Ratio, low-compression cylinder heads.....	A	B	303	328	4.8 to 1	
Ratio, high-compression cylinder heads.....	A	B	303	328	5.3 to 1	Low-compression cylinder heads are standard on 341-A and 303 cars. High-compression cylinder heads are standard on 341-B and 328 cars.
Identification marks—						
Low-compression cylinder heads.....	A	.....	303	.....	No characteristic marks.	
High-compression cylinder heads.....	A	B	303	.....	"HC-53"	5.3 to 1 compression ratio.
	.....	.....	328	.....	"HC-53" "328" at lower edge of head	
Horsepower, rated.....	A	B	.....	.....	35.0 31.2 33.8	
Piston displacement.....	A	B	.....	.....	341 cu. in. 303 cu. in. 328 cu. in.	
Stroke.....	A	B	303	328	4 $\frac{1}{4}$ in.	
CAMSHAFT						
Bearing clearance.....	A	B	303	328	New limits, .0027 to .0037 in. Worn limit, not over .005 in.	
Bearings, out of round.....	A	B	303	328	Not over .005 in.	
End-play in camshaft.....	A	B	303	328	New limits, .005 to .015 in. Worn limit, not over .020 in.	
CHAINS						
CAMSHAFT CHAIN						
Adjustment.....	A	B	303	328	Not adjustable	Before engine unit 3-10155 on 341-A cars and 2-17156 on 303 cars. Beginning with engine unit 3-10155 on 341-A cars and 2-17156 on 303 cars.
No. of links.....	A	B	303	328	54	
Pitch.....	A	B	303	328	$\frac{1}{2}$ in.	
Type.....	A ¹	.....	303 ¹	.....	645	
	A ²	B	303 ²	328	B-45	
Width.....	A	B	303	328	1 $\frac{3}{4}$ in.	
GENERATOR AND WATER PUMP CHAIN						
Adjustment.....	A	B	303	328	$\frac{1}{8}$ in. measured at top of sprocket housing	See Note 3 in Cooling System Group, Page 43. Plate 36, Fig. 3.
No. of links.....	A	B	303	328	57	
Pitch.....	A	B	303	328	$\frac{1}{2}$ in.	
Type.....	A	B	303	328	B-45	

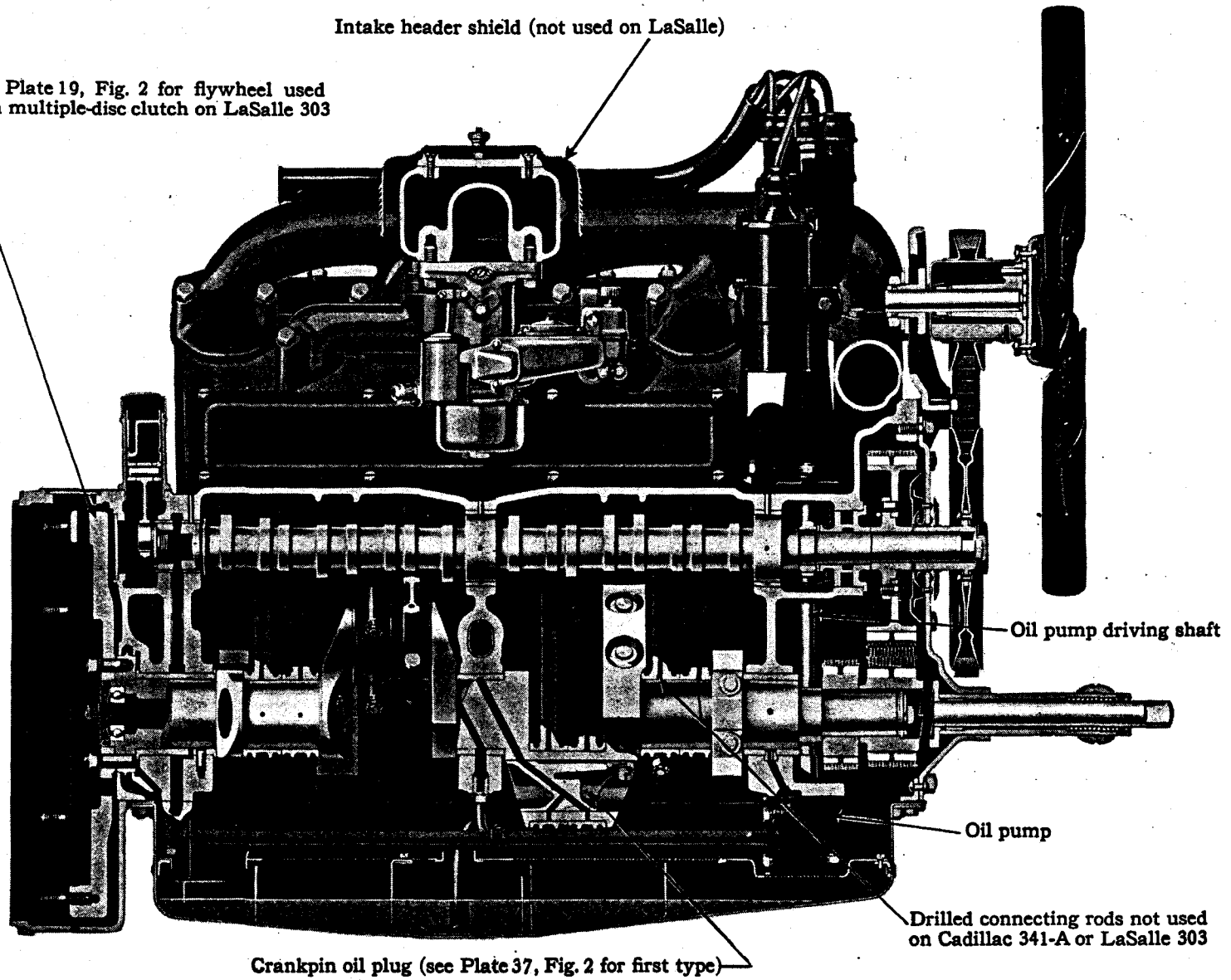


Plate 35. Sectional view of engine.

Subject	Cadillac 341		LaSalle 303-328		Specifications	Remarks
Width.....	A	B	303	328	1 1/4 in.	
CONNECTING RODS						
Alignment.....	A	B	303	328	.....	See Note 1.
Assembly.....	A	B	303	328	.....	See Note 2.
Center to center length.....			3031	.....	10 in.	Before engine unit 2-13001.
	A	B	3032	328	10 1/2 in.	Beginning with engine unit 2-13001 on 303 cars.
Clearance between bushing and piston pin.....	A	B	303	328	.....	See note 6.
Clearance between lower bearing and crankpin.....	A	B	303	328	New limits, .001 to .0025 in. Worn limit, not over .006 in.	See note 3.
End-play of lower bearing.....	A	B	303	328	New limits, .008 to .012 in. Worn limit, not over .015 in.	
CRANKSHAFT AND MAIN BEARINGS						
Crankpin diameter.....	A	B	303	328	2 3/8 in.	
Crankpin journals, out of round.....	A	B	303	328	New limit, .0002 in. Worn limit, not over .004 in.	
End play of crankshaft.....	A	B	303	328	New limits, .002 to .004 in. Worn limits not over .010 in.	
Length of crankshaft, over all.....	A	B	303	328	28 1/4 in.	
Length of crankshaft, front to rear bearing, inclusive...	A	B	303	328	23 1/2 in.	
Main bearing clearance.....	A	B	303	328	New limits, .001 to .002 in. Worn limit, not over .004 in.	See note 4.
Main bearing journals, diameter.....	A	B	303	328	2 3/8 in.	
Main bearing, out of round....	A	B	303	328	New limit, .0002 in. Worn limit, not over .005 in.	
ENGINE LUBRICATION						
Crankcase oil capacity.....	A	B	303	328	.....	See capacities in Lubrication Table, Page 83.
Thinning lubricant with kerosene.....	A	B	303	328	.....	See Lubrication Table, Page 83.
OIL FILTER						
Cartridge, replacement of...	A	B	303	328	12,000 miles	Oil pan and screen should also be removed and cleaned.
Cartridge, type.....	A	B	303	328	A. C. Type B-3	
Valve spring, compression...	A		303	.....	6 ozs. at 3/8 in.	If spring is weak, correct by stretching to 1 1/8—1 3/8 in. A few later cars do not have the check valve.
OIL PUMP						
Backlash between spiral drive gears.....	A	B	303	328	Not over .018 in.	
Clearance between bushing and drive shaft.....	A	B	303	328	New limits, .001—.0025 in. Worn limit, not over .010 in.	
Clearance between bushing in idler gear and shaft....	A	B	303	328	New limits, .001—.0025 in. Worn limit, not over .005 in.	
Clearance between outside diameter of gears and pump body.....	A	B	303	328	New limits, .003—.005 in. Worn limit, not over .008 in.	
End play in pump gears....	A	B	303	328	New limits, .004—.009 in. Worn limit, not over .020 in.	

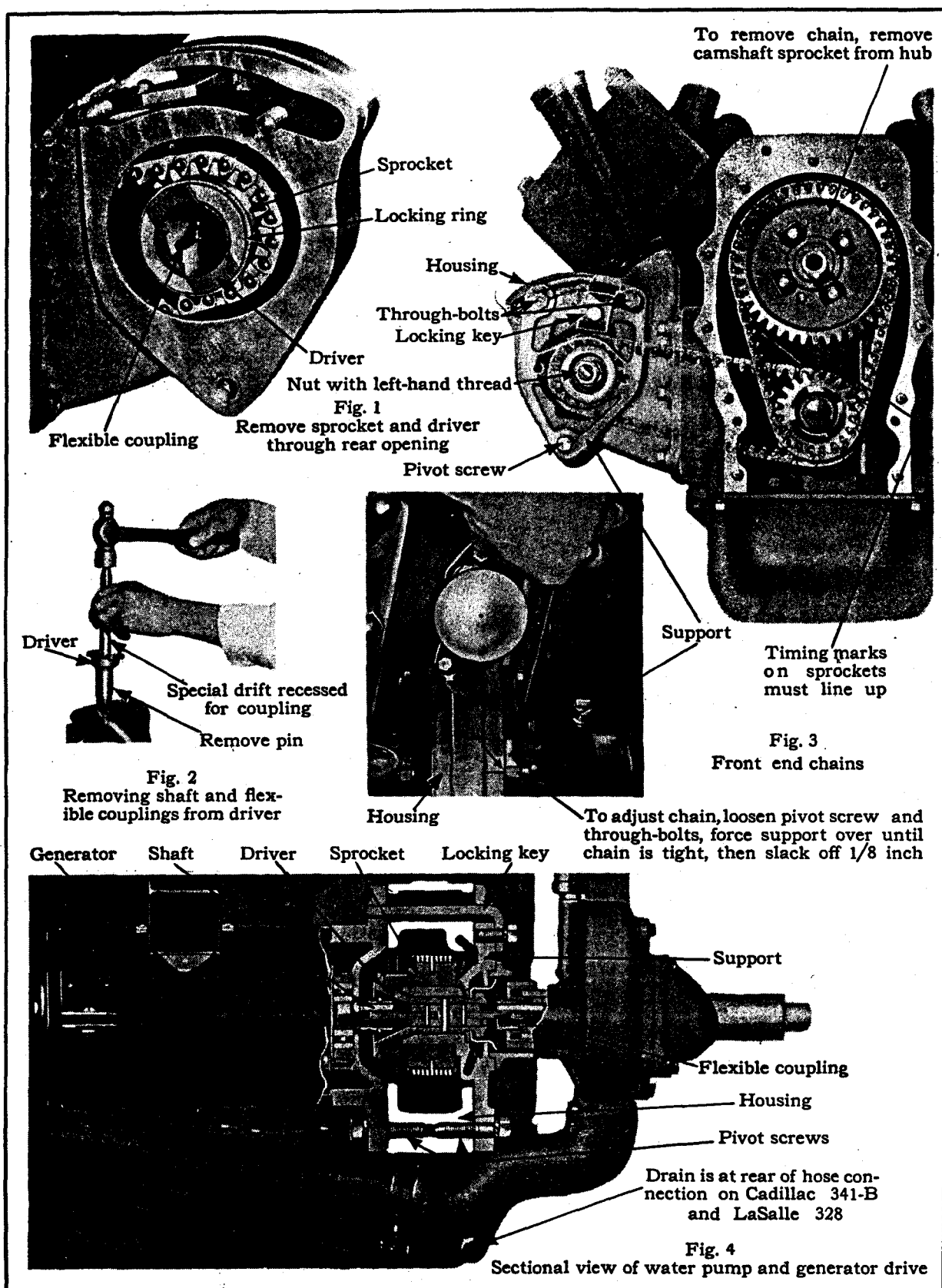


Plate 36. Water pump and generator drive.

Subject	Cadillac 341		LaSalle 303-328		Specifications	Remarks
End play in spiral drive gear.	A	B	303	328	New limits, .005—.015 in. Worn limit, not over .020 in.	Before engine unit 3-10979 on 341-A cars and 2-17542 on 303 cars. Beginning with engine unit 3-10979 on 341-A cars and 2-17542 on 303 cars.
Thickness of pump cover gasket.....	A	B	303	328	.009—.011 in.	
PRESSURE REGULATOR Adjustment.....	A ¹		303 ¹		By-pass adjusting screw	
	A ²	B	303	328	No adjustment necessary	
Clearance between plunger and housing.....	A	B	303	328	New limits, .003—.006 in. Worn limit, not over .008 in.	
Normal pressure.....	A	B	303	328	5-10 lbs. at idling speed	
Plunger valve opens.....	A	B	303	328	20 lbs.	
Spring, free length.....	A	B	303	328	1¾ in.	
Spring, compression.....	A	B	303	328	2 lb. at 1½ in.	
PISTONS AND CYLINDERS						
Cylinder bore, out of round...	A	B	303	328	New limit, .0005 in. Worn limit, not over .002 in.	See note 5.
Piston, out of round.....	A	B	303	328	New limit, .0005 in. Worn limit, not over .002 in.	
Piston clearance at top land...	A	B	303	328	.015 in. minimum	
Piston clearance at skirt.....			303		New limit, .0025 in. }	
	A	B		328	New limit, .003 in. }	The four bores of the same cylinder block are held within .0005 in. of each other.
Limits on cylinder bore, standard.....	A	B			3.3125—3.3145 in. }	
				303	3.125—3.127 in. }	
				328	3.2500—3.2520 in. }	
Limits on cylinder bore.	A	B	303	328	Oversize Cylinders are honed to fit the pistons with which they are supplied.
Limits on pistons—						
Standard No. 1.....	A	B			3.309—3.3095 in. }	Marked U1, U2, U3 and U4, respectively.
No. 2.....	A	B			3.3095—3.310 in. }	
No. 3.....	A	B			3.310—3.3105 in. }	
No. 4.....	A	B			3.3105—3.311 in. }	
Standard No. 1.....			303		3.1222—3.1227 in. }	First type with ¾ in. piston pin hole marked P1, P2, etc. Second type with ⅜ in. piston pin hole marked V1, V2, etc.
No. 2.....			303		3.1227—3.1232 in. }	
No. 3.....			303		3.1232—3.1237 in. }	
No. 4.....			303		3.1237—3.1242 in. }	
No. 5.....			303		3.1242—3.1247 in. }	
No. 6.....			303		3.1247—3.1252 in. }	
No. 7.....			303		3.1252—3.1257 in. }	
Standard No. 1.....				328	3.2455—3.2460 in. }	Marked AA1, AA2, etc.
No. 2.....				328	3.2460—3.2465 in. }	
No. 3.....				328	3.2465—3.2470 in. }	
No. 4.....				328	3.2470—3.2475 in. }	
Oversize—						
+ .005	A	B			3.314—3.315 in. }	Marked +.005
				303	3.1272—3.1288 in. }	
				328	3.2505—3.2515 in. }	Marked +.010
+ .010	A	B			3.319—3.320 in. }	
				303	3.1322—3.1332 in. }	
				328	3.2555—3.2565 in. }	Marked +.015
+ .015	A	B			3.324—3.325 in. }	
				303	3.1372—3.1382 in. }	
				328	3.2605—3.2615 in. }	

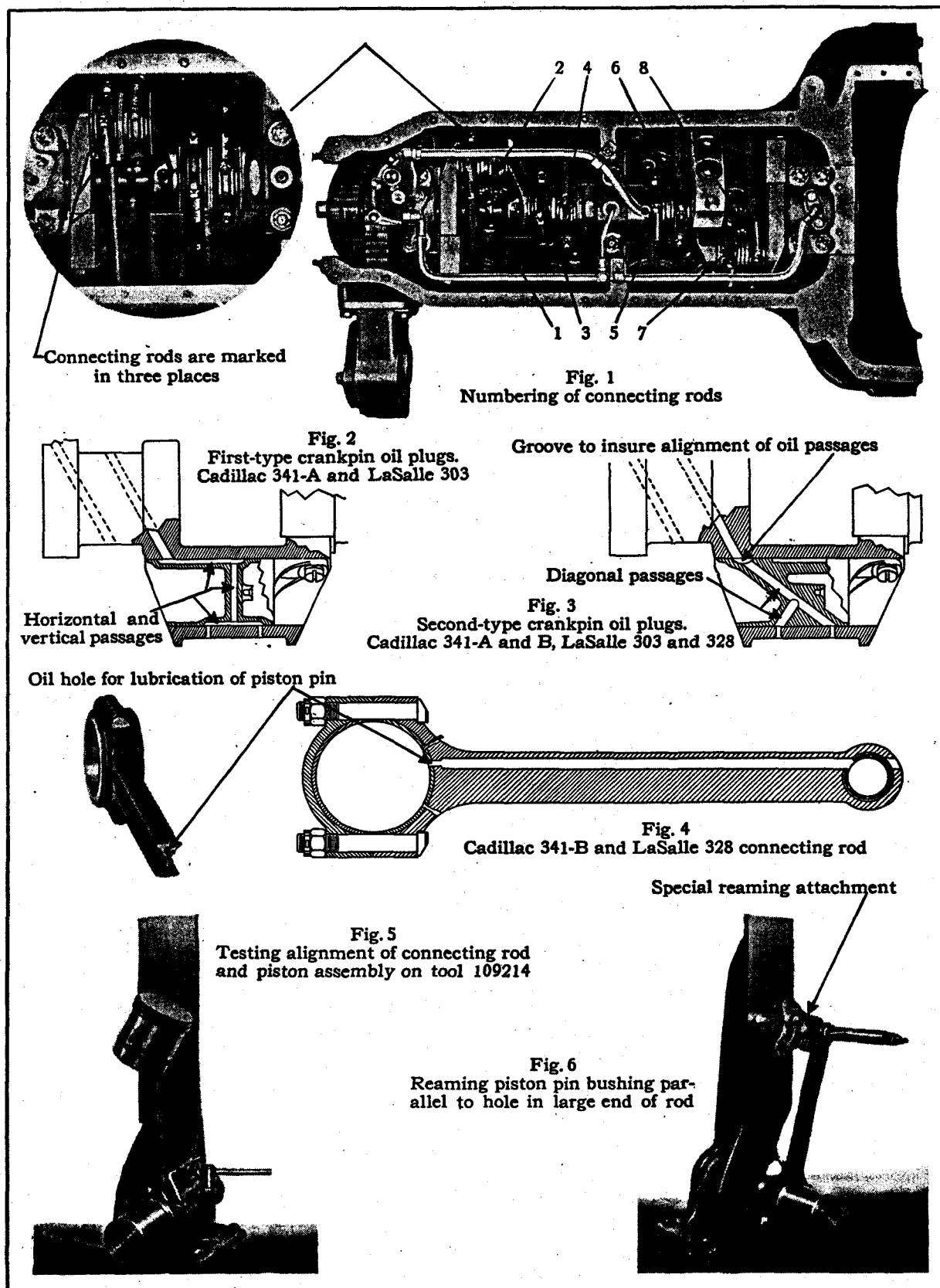


Plate 37. Connecting rod details.

Subject	Cadillac 341		LaSalle 303-328		Specifications	Remarks
+ .020	A	B	.....	.....	3.329—3.330 in.	Marked +.020
	.....	.....	303	.....	3.1422—3.1432 in.	
	.....	.....	328	.....	3.2655—3.2665 in.	
+ .030	A	B	.....	.....	3.339—3.340 in.	Marked +.030
	.....	.....	328	.....	3.2755—3.2765 in.	
+ .031	.....	.....	303	.....	3.1532—3.1542 in.	Marked +.031
PISTON PINS						
Diameter.....	.....	.....	303 ¹	.....	$\frac{3}{4}$ in.	Before engine unit 2-13001 Beginning with engine unit 2-13001 on 303 cars.
	A	B	303 ²	328	$\frac{3}{8}$ in.	
Clearance between pin and bushing.....	A	B	303	328	.....	See note 6.
Clearance between pin and piston.....	A	.....	303	.....	Hand press fit	See note 7.
	.....	B	.....	328	100 to 600 lbs. press fit on lock screw end (hand push fit on opposite end)	
Identification marks.....	A	.....	303	.....	No characteristic marks.	Piston pins for 341-A engines must not be installed in 328 engines as they will score the cylinders. <i>Plate 40, Fig. 2</i>
	.....	B	.....	328	60° notch .015 in. deep on end opposite lock screw.	
Lubrication.....	A	.....	303	.....	Splash	
	.....	B	.....	328	Pressure feed through hole drilled in connecting rod.	
PISTON RINGS						
Clearance between piston rings and grooves in piston.....	A	B	303	328	New limits, .0015—.0025 in. Worn limit, not over .004 in.	
Gap clearance.....	A	B	.....	328	New limits, .008—.018 in. Worn limit, not over .025 in.	
	.....	.....	303	.....	New limits, .005—.015 in. Worn limit, not over .025 in.	
	
Number of compression rings..	A	B	303	328	2	Before engine unit 2-6918. Beginning with engine unit 2-6918 on 303 cars.
Number of oil rings.....	A	B	303	328	1	
Ring installation.....	.....	.....	303 ¹	.....	All rings above piston pin	
	A	B	303 ²	328	2 comp. rings above pin 1 oil ring below pin $\frac{1}{16}$ in.	
Width of rings.....	A	B	303	328	$\frac{1}{16}$ in.	
VALVES						
Clearance between valve lifter and guide.....	A	B	303	328	New limits, .0015—.002 in. Worn limit, not over .005 in.	Before engine unit 3-14057 on 341-A cars and 2-20272 on 303 cars com- pression pressure was 133-139 lbs. with spring compressed to 2.148 in.
Clearance between valve lifter roller and pin.....	A	B	303	328	New limits, .0015—.0025 in. Worn limit, not over .004 in.	
Spring compression, valve closed.....	A	B	303	328	77-81 lbs. at 2.5 in.	
Spring compression, valve open.....	A	B	303	328	156-164 lbs. at 2.148 in.	
Spring type.....	A ¹	.....	303 ¹	.....	Straight	Before engine unit 3-14057 on 341-A cars and 2-20272 on 303 cars. Beginning with engine unit 3-14057 on 341-A cars and 2-20272 on 303 cars. Conical Springs should be installed with large end at bottom.
	A ²	B	303 ²	328	Conical	

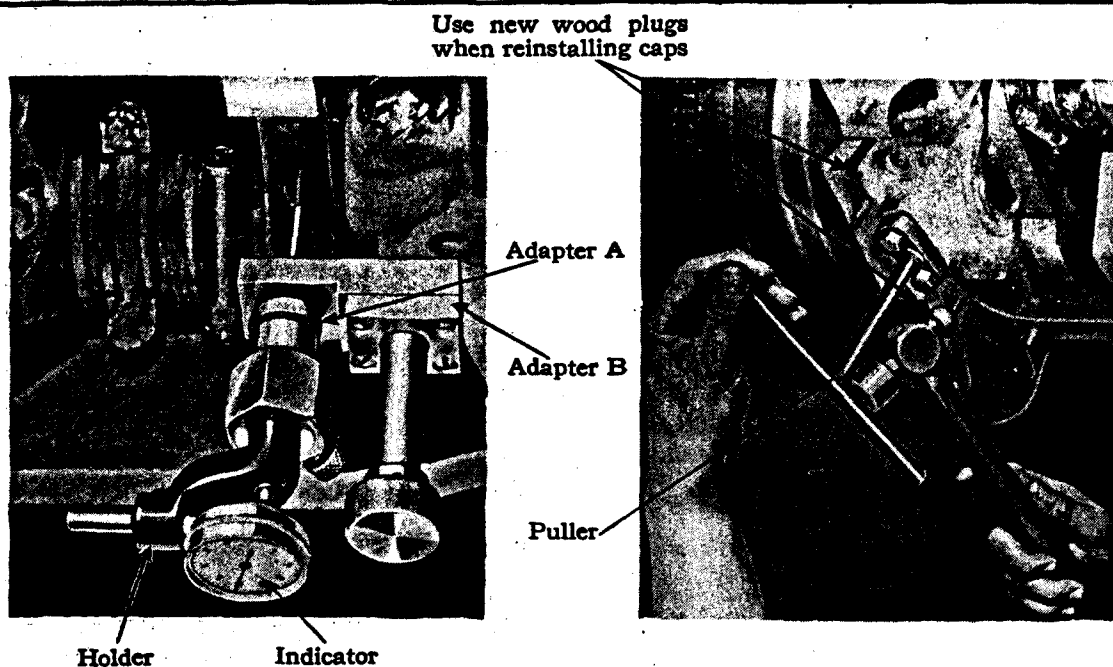


Fig. 1
Indicating clearance in front main bearing.
Use adapters A and B with holder 65530
(Use adapter A only for center main bearing)

Fig. 2
Removing rear main bearing
cap with puller 109406

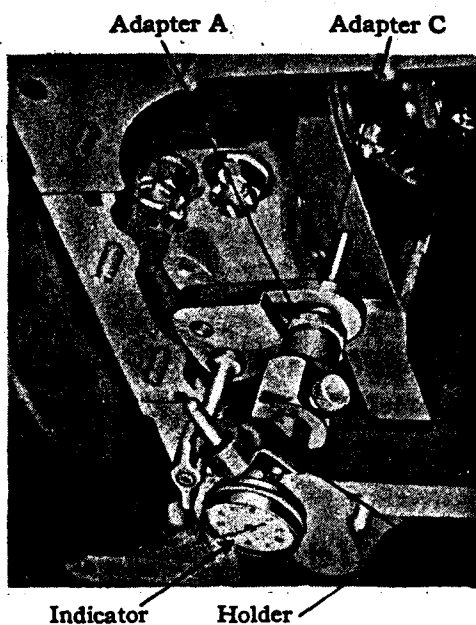


Fig. 3
Indicating clearance in rear main bearing.
Use adapters A and C with holder 65560

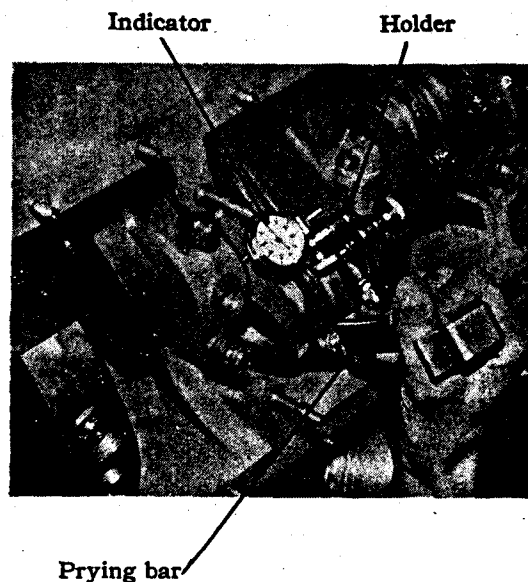


Fig. 4
Indicating clearance in connecting rod bearing.
Holder 109414, prying bar 109415

Subject	Cadillac 341		LaSalle 303-328		Specifications	Remarks
INLET VALVES						
Clearance between stem and guide in cylinder blocks. . . .	A	B	303	328	New limits, .001 to .0035 in. Worn limit, not over .006 in.	Adjust when engine is cold.
Clearance between stem and valve lifter.	A	B	303	328	.004 in.	
Head diameter.	A	B	303	328	1.660—1.666 in.	
Lift.	A	B	303	328	$\frac{3}{4}$ in.	
Seat, angle of.	A	B	303	328	30°	
Seat, width of.	A	B	303	328	$\frac{1}{8}$ in.	
Stem diameter.	A	B	303	328	$\frac{3}{8}$ in.	
Stem length.	A	B	303	328	6 $\frac{1}{2}$ in. from seat	
EXHAUST VALVES						
Clearance between stem and guide in cylinder block.	A	B	303	328	New limits, .002 to .0045 in. Worn limit, not over .006 in.	Adjust when engine is cold. Before engine unit 3-5809 on 341-A cars and 2-15992 on 303 cars. Beginning with engine unit 3-5809 on 341-A cars and 2-15992 on 303 cars.
Clearance between stem and valve lifter.	A	B	303	328	.006 in.	
Head diameter.	A	B	303	328	1.634—1.640 in.	
Lift.	A	B	303	328	$\frac{3}{4}$ in.	
Angle of seat.	A	B	303	328	45°	
Seat, width of.	A ¹		303 ¹		$\frac{1}{8}$ in.	
	A ²	B	303	328	$\frac{1}{4}$ in.	
Stem diameter.	A	B	303	328	$\frac{3}{8}$ in.	
Stem length.	A	B	303	328	6 $\frac{1}{2}$ in. from seat	
VALVE TIMING						
Intake valve, opens.	A	B	303	328	91 $\frac{1}{2}$ ° before top dead center	See note 8.
Intake valve, closes.	A	B	303	328	58 $\frac{1}{2}$ ° after bottom dead center	
Exhaust valve, opens.	A	B	303	328	46° before bottom dead center	
Exhaust valve, closes.	A	B	303	328	5° after top dead center	

1. Straightening Connecting Rods

La Salle and Cadillac connecting rods are of alloy steel of such toughness that it is not entirely satisfactory to align them by straightening. If attempt is made to straighten a rod it is apt to return sooner or later to its original shape.

In manufacture, the piston pin bushing is bored in a fixture which insures perfect parallelism between the hole in the large end of the rod and the hole bored in the bushing.

In service, the same thing can be accomplished by reaming on the special fixture which is provided for this purpose. (Tool Numbers 109214-5-6).

If straightening is resorted to, care must be taken to bend or twist the rod farther than necessary to align it and then spring the rod back in the original direction until it is straight. This procedure helps to "normalize" the strains in the steel and prevent further distortion from taking place.

2. Assembly of Connecting Rods

The following points should be checked when installing connecting rods:

1. The chamfered face of the bearings should be toward the end of the crankpin, the plain faces toward each other.

2. The numbers on the rods should be toward the bottom of the engine.

3. The oil holes in the rods should point toward the pistons.

4. The numbers on the caps should correspond to the numbers on the rods.

3. Connecting Rod Bearings

The connecting-rod bearing clearance should be measured with a dial indicator using the fixture designed for the purpose. (Tool Number 109414).

The connecting rod bearings are not separate parts but are cast in place in the connecting rod by a special process. The bearings are not adjustable and no attempt should be made to dress down the cap on the rod to take up the clearance. When a connecting rod bearing clearance exceeds the prescribed amount the rod should be removed and replaced with a rebabbitted rod. Rebabbiting of rods should not be attempted outside the factory. Rods should be returned to the factory and exchanged for rebabbitted rods. Rods, the caps of which have been dressed down, will not be exchanged.

4. Main Bearings

It is recommended that main bearing clearance be in-

dicated with a dial indicator using the special fixture supplied for the purpose. (Tool Number 65530).

No shims or liners are used under the main bearing caps and no attempt should be made to take up the bearings to compensate for wear. When worn enough to require it, the bearings should be replaced. Replacement bearings are furnished to exact size and do not require reaming or scraping.

Special attention is required when removing or installing the rear main bearing cap because the sides of this cap must be oil tight. For this purpose, wood plugs are driven into grooves in the cap when it is installed. To remove the cap a special puller is necessary. New wood plugs must then be installed after the cap is put back.

5. Piston Clearance

The piston clearance should be measured with feeler ribbons. A feeler ribbon .003-inch thick and $\frac{1}{4}$ to $\frac{1}{2}$ -inch wide should be used on Cadillac 341-A and B and La Salle 328 engines. On La Salle 303 engines, a feeler ribbon .0025-inch thick preferably $\frac{1}{4}$ -inch wide, should be used. The measurement should be taken at the skirt of the piston and at right angles to the piston pin with the piston midway between the top and bottom of the cylinder bore.

To measure accurately with feeler ribbons, consideration must be given to the pull required to withdraw the ribbon. The pull required for both the .0025-inch and the .003-inch ribbons should be between $2\frac{1}{2}$ and 5 lbs. This test must be made with no oil on either the cylinder or piston. It is also very essential that the piston be not more than .0005-inch out of round at the skirt.

6. Fitting Piston Pins in Bushings

The recommended test for piston pin fit on engines with all three rings above the piston pin (first type on

La Salle) is to hold the piston and rod assembly by the piston in a horizontal position. The connecting rod should then just drop of its own weight.

On engines with the oil ring below the piston pin, test by spinning the piston pin in the bushing perfectly dry. The pin should be free enough to spin but should have no perceptible looseness.

Piston pin bushings should preferably be reamed in the special aligning and reaming fixture furnished for the purpose.

7. Fitting Piston Pins in Pistons

The present practice in manufacture is to make one end of the piston pin a tight press fit in the side of the piston with the locking screw and the other end a hand press fit to allow for expansion. In service it is customary to fit both ends of the piston pin the same, which should allow a hand press fit. In other words, it should be just possible to push the pin into the piston by pressing with both thumbs on the end of the pin.

CAUTION: When removing and installing the piston pins always place the locking screw side of the piston pin down so that the pressure on the pin will not force the piston out of round.

8. Valve Timing

Because of the shape of the cams, the exact time of opening and closing of the valves depends upon the valve stem clearance and may vary as much as 10 degrees. The accompanying figures are actual readings taken on a cold engine.

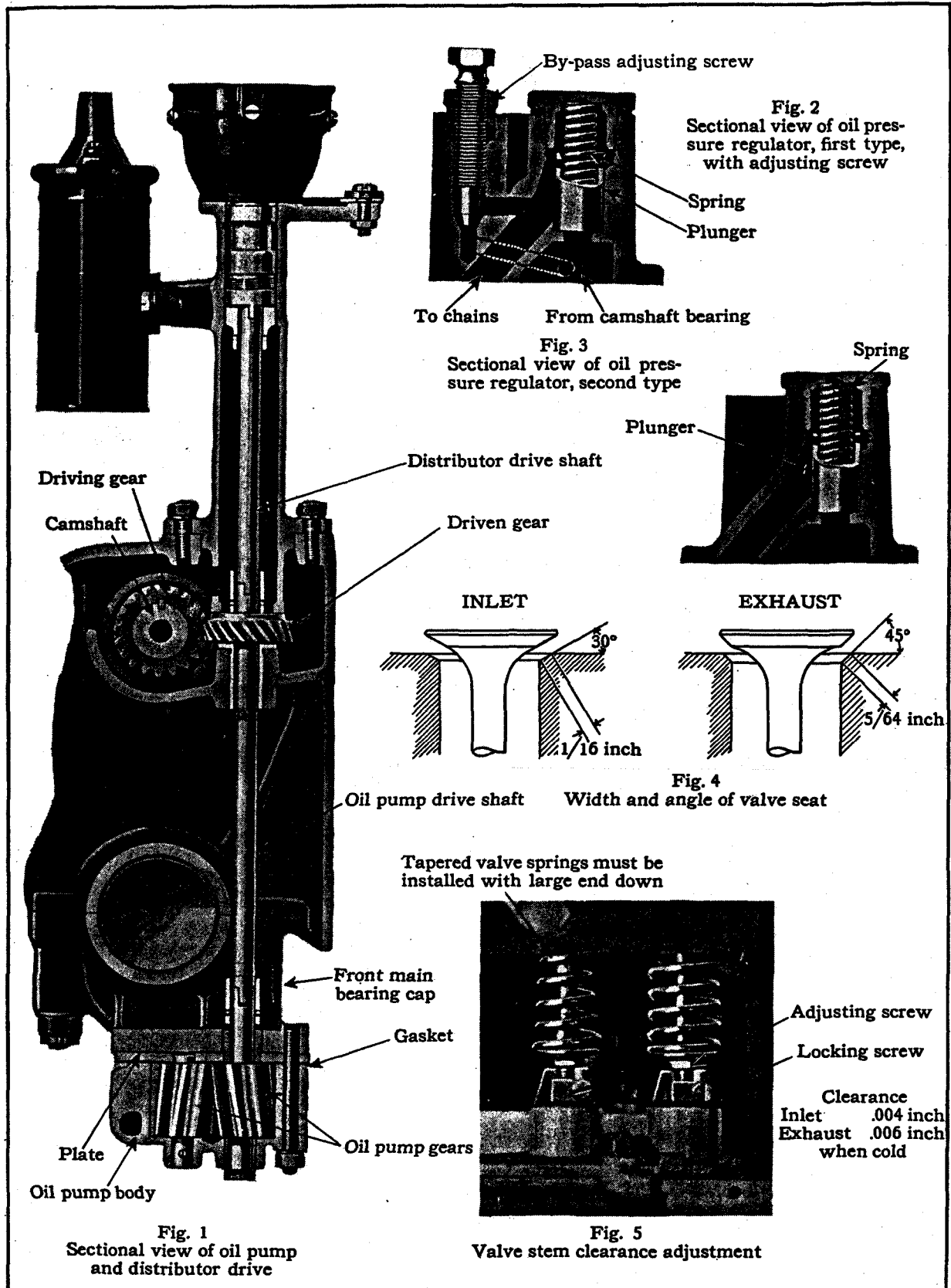


Plate 39. Oil pump, pressure regulator and valves.

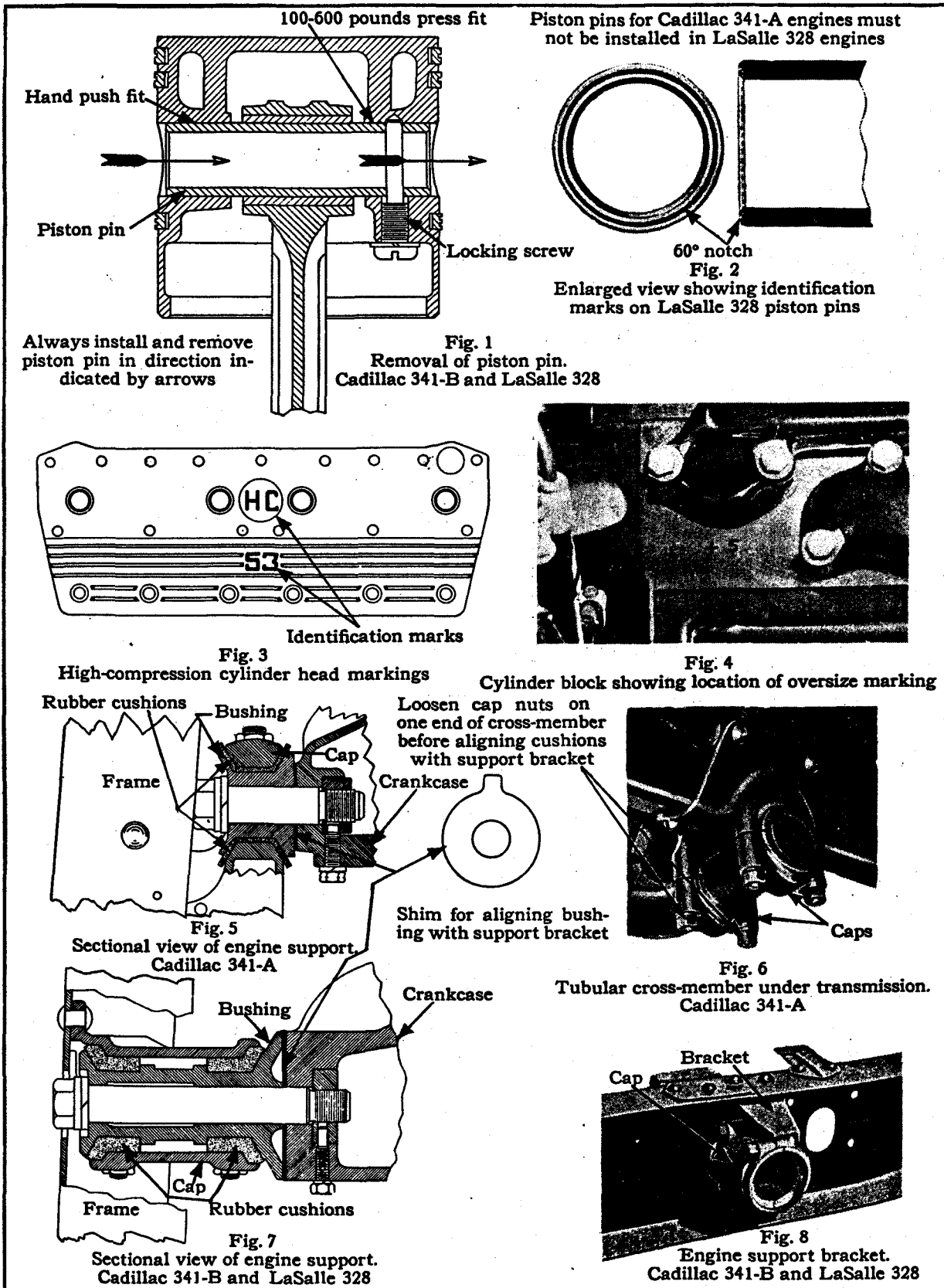


Plate 40. Cylinder head, piston pin and engine rear support.

Frame

Subject	Cadillac 341		LaSalle 303-328		Specifications	Remarks
Wheelbase.....	A	B	140 in. and 152 in.	Chassis with 152-in. wheelbase are intended primarily for commercial type bodies such as ambulances, etc.
Overall length of car.....	.....	.....	303	328	125 in. and 134 in.
	A	B	.....	.....	213¼ in., 140 in. wheelbase
Overall width of car.....	303	328	185 in., 125 in. wheelbase	
	A	B	.....	.....	196½ in., 134 in. wheelbase
	.....	.....	303	328	73½ in., 140 in. wheelbase.
FRAME						
Depth.....	A	7½ in.	Measured at deepest part of frame.
	.....	.....	303	.....	6½ in.
	.....	B	.....	.....	8 in.
	.....	.....	.....	328	6½ in.
Flange width.....	A	3¼ in.	
	.....	B	.....	.....	3¼ in. top, 2½ in. bottom
Kick up, front.....	303	328	2½ in.	
	A	B	.....	.....	1¾ in.
Kick up, rear.....	303	328	¾ in.	
	A	B	.....	.....	4 in.
Width, front.....	303	328	5 in.	
	A	.....	.....	.....	30½ in.
	.....	.....	303	.....	29 in.
	.....	B	.....	.....	30 in.
Width, rear.....	328	29½ in.	
	A	.....	.....	.....	35½ in.
	.....	.....	303	.....	37½ in.
	.....	B	.....	.....	35 in.
Unit (Chassis) number, location of.....	328	37½ in.	
	A	B	303	328	On upper surface of left side bar opposite steering gear	

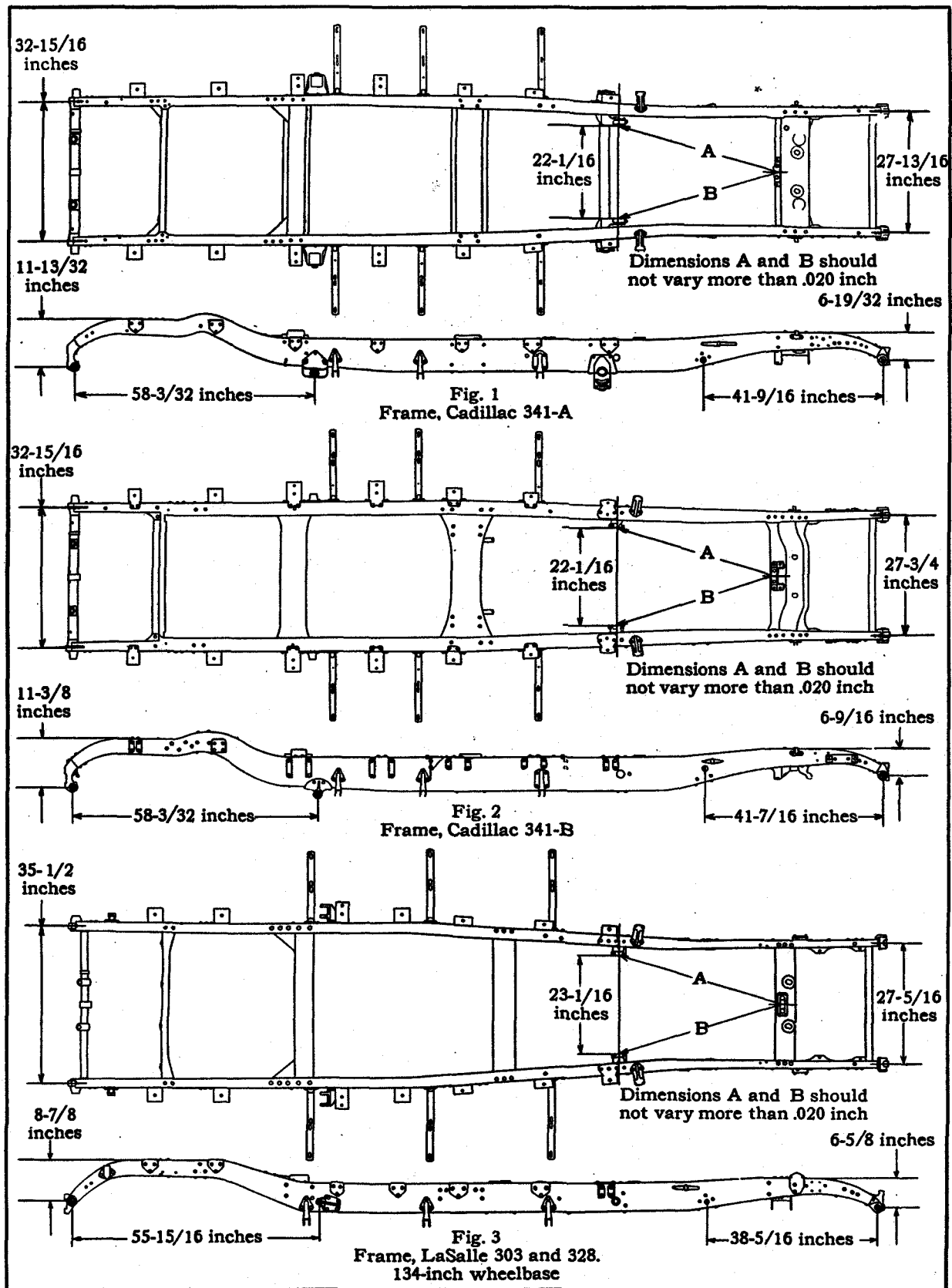


Plate 41. Diagrams of Cadillac and La Salle frames.

Gasoline System

Subject	Cadillac 341		LaSalle 303-328		Specifications	Remarks
Capacity of supply tank.....	A	B	....	....	21 gal.	Maximum gauge reading 20 gal.
.....	...	...	303	328	20 gal.	
Feed.....	A	B	303	328	Vacuum tank with auxiliary vacuum pump	
Gasoline gauge.....	A	B	303	328	Electric (Nagel)	
CARBURETOR						
Clearance between throttle disc and carburetor body...	A	B	303	328	New limit, .003 in.	
End play in throttle shaft....	A	B	303	328	Worn limit, not over .005 in.	
Float setting.....	A	B	303	328	New limit, .0015 in.	
Size.....	A	B	303	328	Worn limit, not over .005 in.	
Size of nozzle.....	A	B	303	328	$\frac{1}{16}$ in.	
Throttle pump adjusting screw, fully open.....	A	B	303	328	2 in. (nominal)	
Thermostat	A	B	303	328	No. 16	
Air valve adjustment.....	A	B	303	328	7 turns	
Throttle pump control, closes	A	B	303	328	$\frac{1}{16}$ $\frac{1}{16}$ in. Open at 65-85°F.	
Throttle pump control, opens	A	B	303	328	74°F. } Inner thermostat	
Vent control, closes.....	A	B	303	328	78°F. }	
Vent control, opens.....	A	B	303	328	125°F. } Outer thermostat	
Unit number, location of...	A	B	303	328	130°F. }	
VACUUM PUMP						
Clearance between connecting rod and crank journal on camshaft.....	A	B	303	328	Right side front on top flange	
Clearance between piston and cylinder.....	A	B	303	328	New limits, .001—.003 in.	
					Worn limits, not over .005 in.	
					New limits, .001—.0015 in.	
					Worn limit, not over .003 in.	

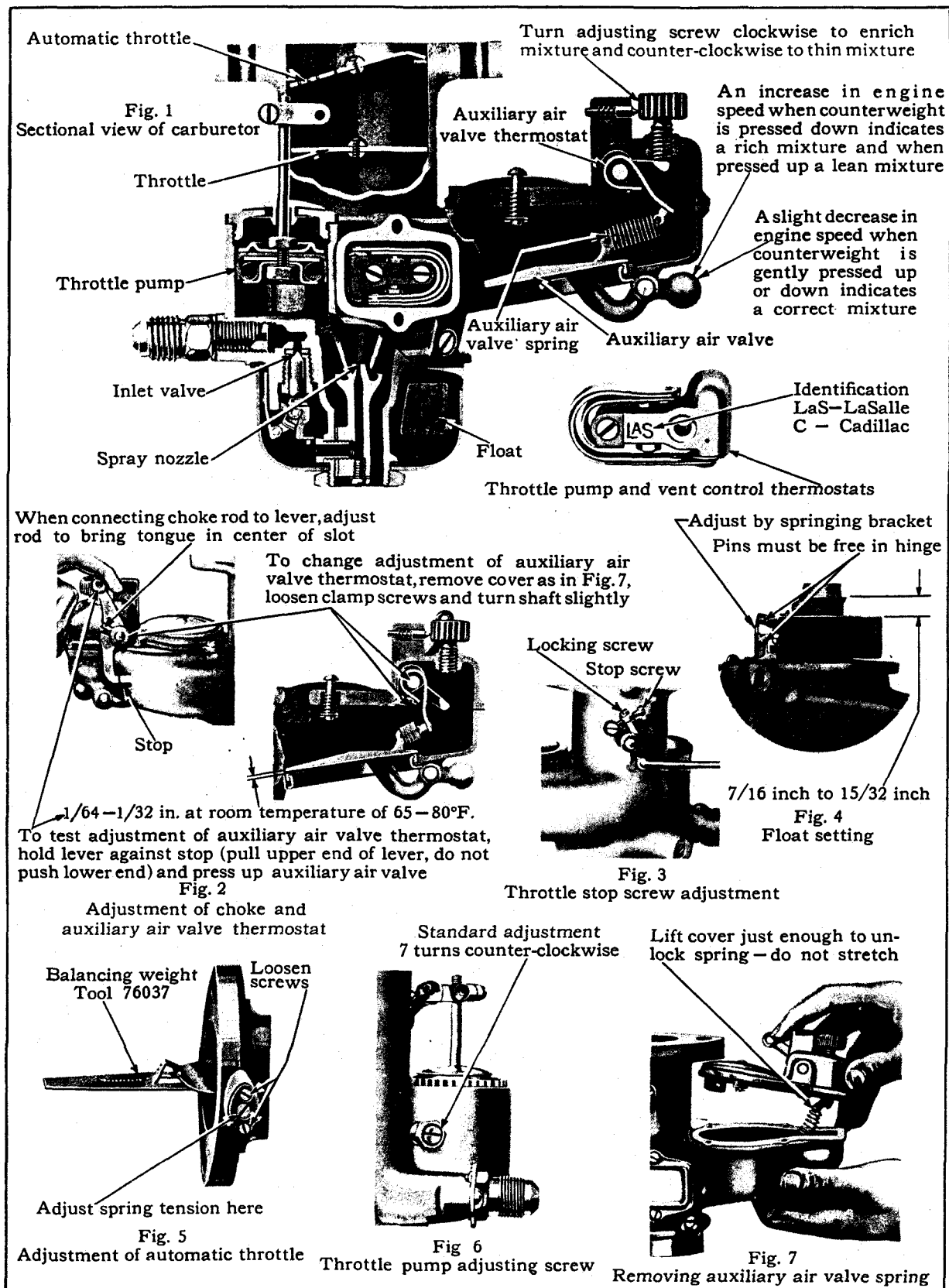


Plate 42. Carburetor adjustments.

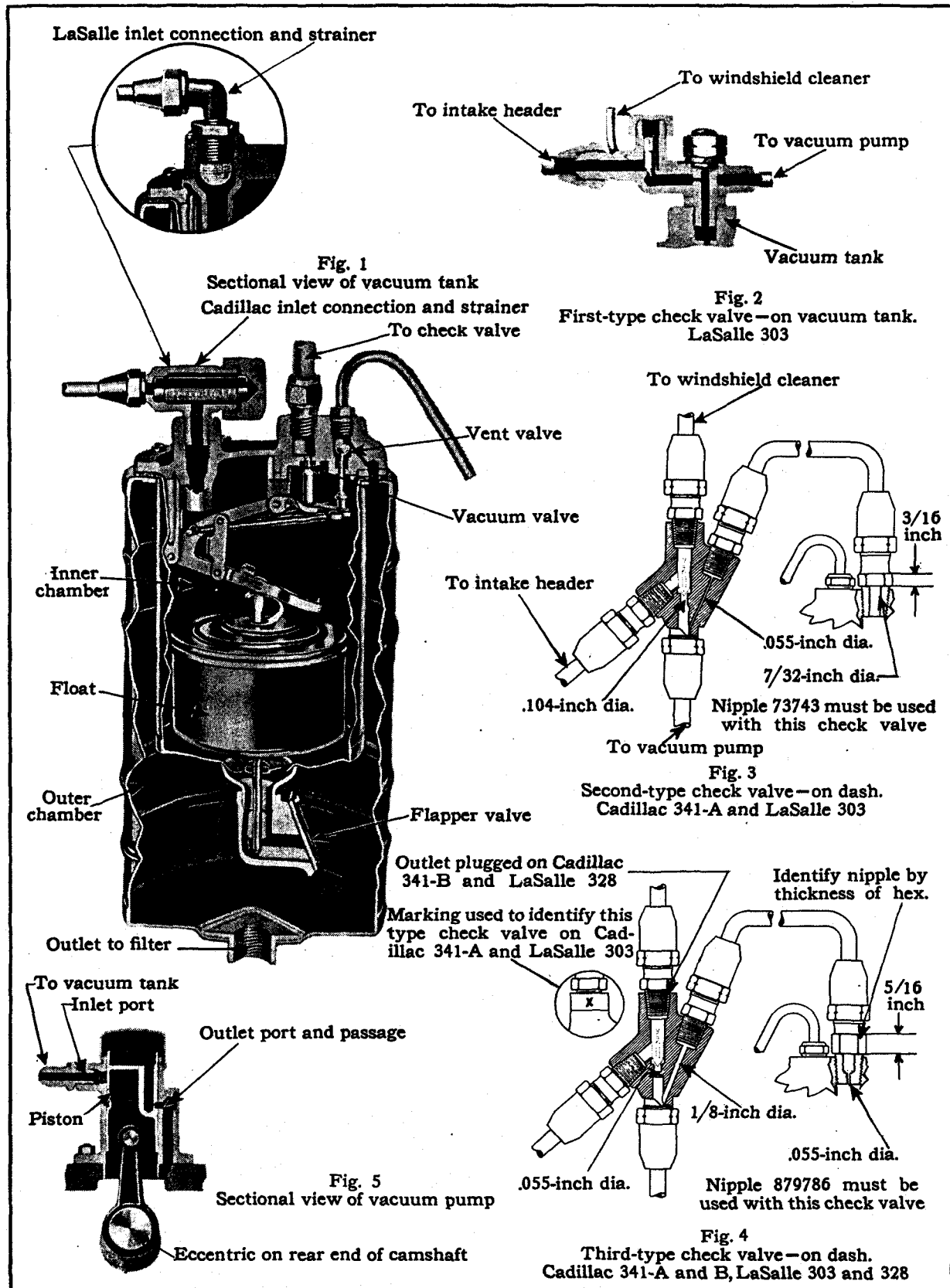


Plate 43. Vacuum tank, pump and check valve.

GASOLINE SYSTEM

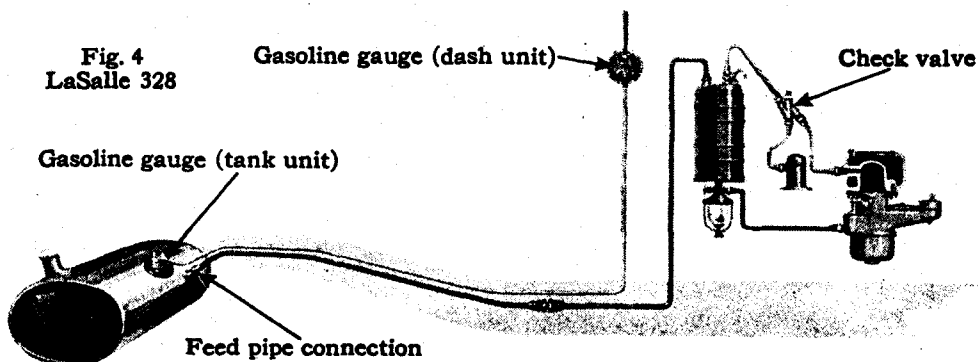
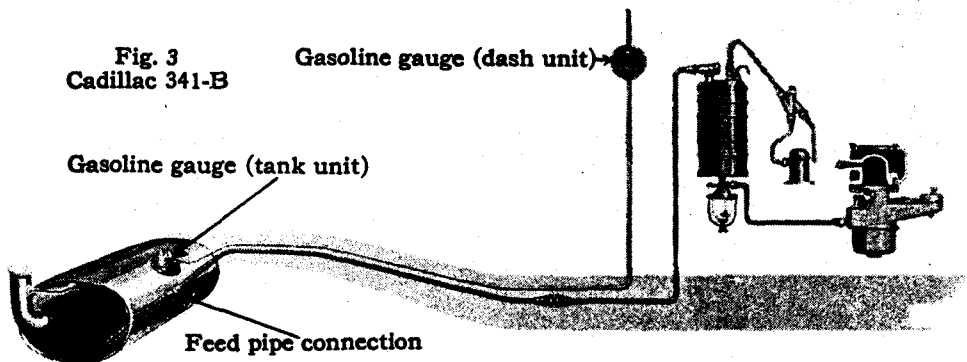
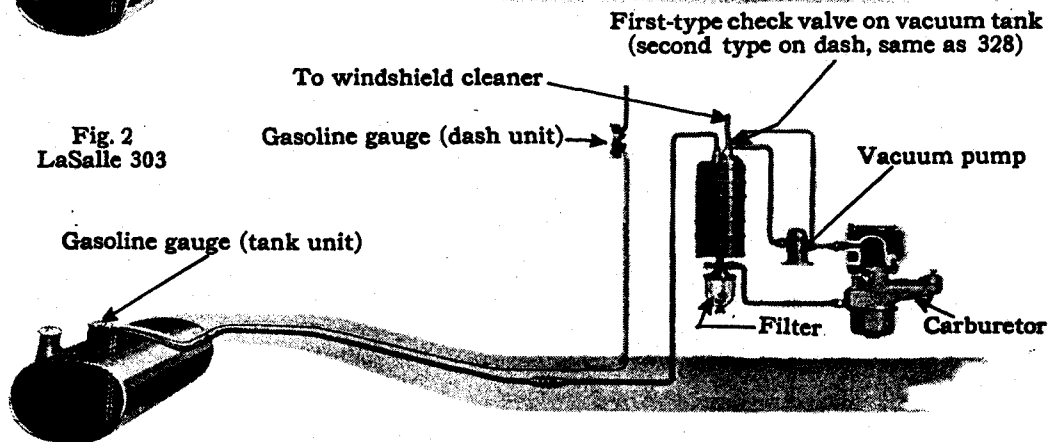
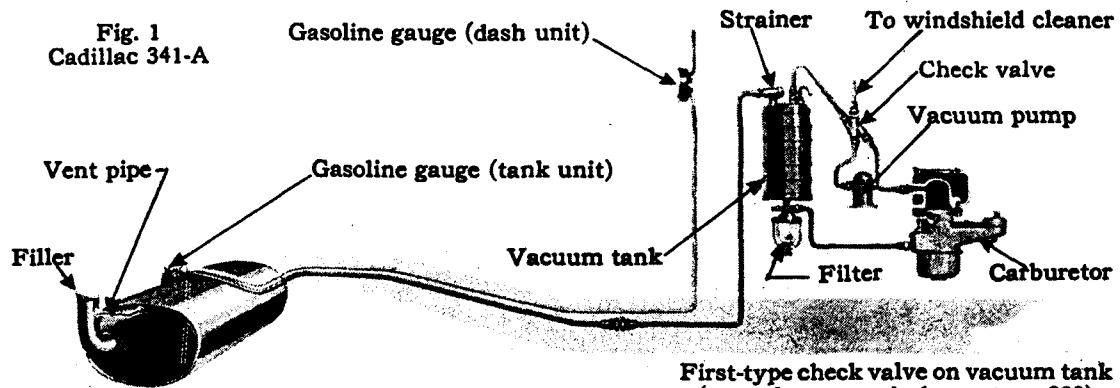


Plate 44. General arrangement of gasoline systems.

Lighting System

Subject	Cadillac 341		LaSalle 303-328		Specifications	Remarks
Cleaning headlamp reflectors..	A	B	303	328	See note 1.
Headlamp lens, diameter.....	A	B	.....	.....	11 $\frac{1}{4}$ in.
	.....	.....	303	328	10 $\frac{1}{4}$ in.
Lamp bulbs, single or double contact.....	A	B	303	328	All single contact except two- filament headlamp bulbs which are double contact.	
Lamp bulb, sizes—					Candlepower Mazda number	See note 2.
Headlamp bulb.....	A	B	303	328	21—21 1110	
Headlamp bulb.....	A	B	303	328	32—21 1116	Can be used as permitted by state regulations.
Parking lamp bulb.....	A	B	303	328	3 63	
Instrument lamp bulb.....	A	B	303	328	3 63	
Stop lamp bulb.....	A	B	.....	.....	21 1129
	.....	.....	303	328	15 87
Tail lamp bulb.....	A	B	.....	.....	3 63
Running board step lamp bulb.....	A	B	.....	.....	3 63
Closed car dome lamp bulb.	A	B	303	328	3 63	
Rear quarter lamp bulb....	A	B	303	328	3 63	
Voltage.....	A	B	303	328	6—8 volts	
Stop light, setting.....	A	B	303	328	Switch lever in "on" position at $\frac{3}{4}$ —1 in. movement of brake pedal	

1. Cleaning Headlamp Reflectors

To preserve the original reflector surface as much as possible, it should be polished with a good cleaner that is free from abrasive materials. A paste made of rouge or talcum powder and alcohol makes a good cleaner for this purpose. A clean cloth should be used and all rubbing should be done in straight lines from the bulb outward. Circular rubbing leaves fine lines which break up the beam of light, whereas rubbing straight from the bulb outward leaves lines parallel to the rays of light, which do not interfere with the reflection.

2. Headlamp Bulbs

Headlamp bulbs for Cadillac and La Salle cars have two

filaments, one above the other, instead of the customary single filament. The filaments are located in different positions with respect to the focus of the parabolic reflector, and the beam of light from one filament is projected at a different angle from the other.

When the switch lever is in one position one set of filaments is lighted and the beams are projected straight ahead, illuminating the road at a distance. When the switch lever is in the other position, the other filaments are lighted and the beams are projected down at an angle, illuminating more brightly the road directly in front of the car.

LIGHTING SYSTEM



Fig. 1
Lighting switch at bottom of steering gear. Cadillac 341-A and LaSalle 303

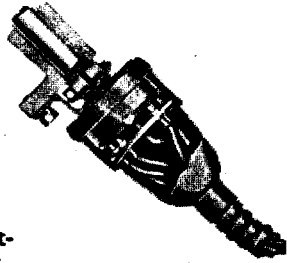


Fig. 2
Lighting switch at bottom of steering gear. Cadillac 341-B and LaSalle 328

One-half of distance between centers of lamps

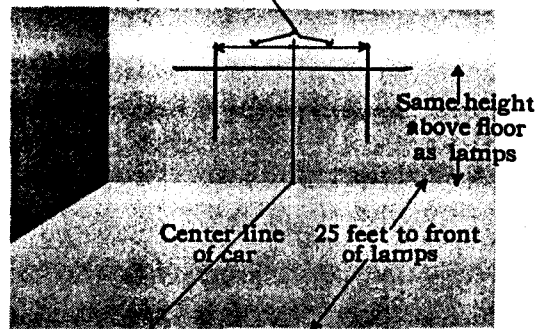


Fig. 5
Markings for adjustment of head lamps

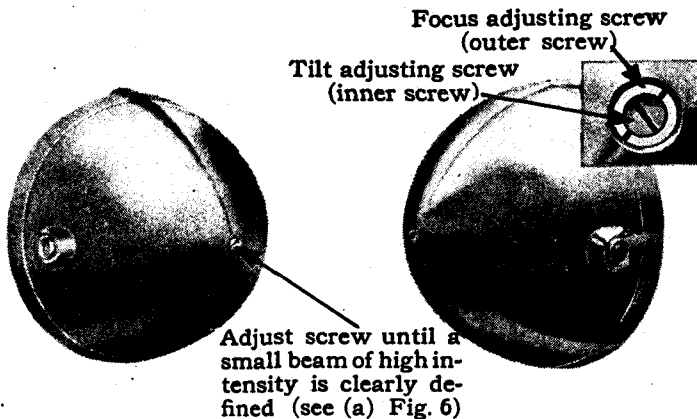
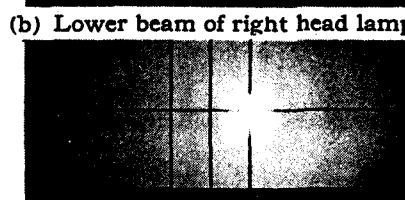
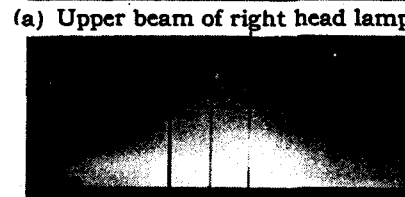
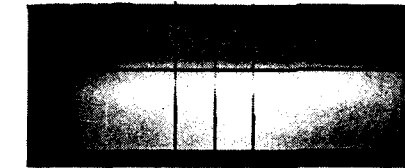


Fig. 3
Head lamp adjusting screw. Cadillac 341-A and B; LaSalle 303, second type, and 328

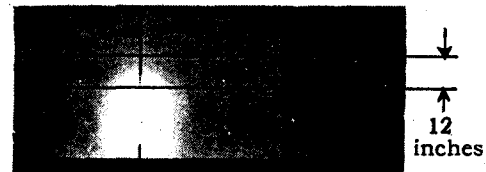
Fig. 4
Head lamp adjusting screws. LaSalle 303, first type



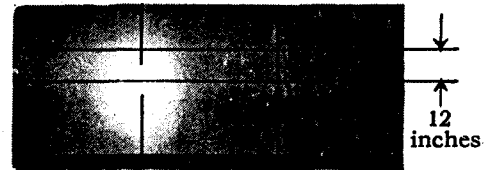
(a) Upper beam of right head lamp
(b) Lower beam of right head lamp
(c) Upper beam with lens removed

Fig. 6

Light beams with lamp properly focused and aimed. Cadillac 341-A and B; LaSalle 303, second type, and 328. After adjusting one head lamp, repeat adjustment on other lamp



(a) Left-hand lower beam without lens



(b) Left-hand upper beam without lens

Fig. 7

Light beams with lamp properly focused and aimed. LaSalle 303 with first-type head lamp. After adjusting one lamp, repeat adjustment on other lamp

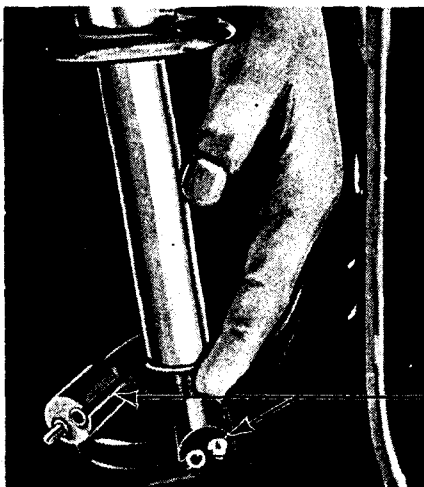


Fig. 8
Disconnecting wires on LaSalle 328 head lamp. Slotted coupling plugs used only on Cadillac 341-B and LaSalle 328. Coupling plugs are at top of conduits on Cadillac 341-A and B

Lubrication

Subject	Cadillac 341		LaSalle 303-328		Specifications	Remarks	
Oil pressure, engine.....	A	B	303	328	7-10 lbs. at idling speed	See note 1.	
Kerosene, for thinning—					Tem- perature		Per Cent Kerosene
Gear lubricant.....	A	B	303	328	20° to -10°		10
					-10° to -30°		25
					Below -30°	40	
CAPACITIES							
Engine.....	A	B	303	328	8 qts.	See chart below for recommendations.	
Fan.....	A	B	303	328	1 pint, approximately		
Rear axle.....	A	B	303	328	2½ qts.		
					3 qts.		
Transmission.....	A	B	303	328	2½ qts.	See lubrication diagrams pages 84, 85, 86 and 87, for points where lubricants are to be used. See note 2.	
					1½ qts.		
LUBRICANTS							
Chassis grease.....	A	B	303	328	G11 (A-200 plus 5% calcium soap)		See chart below. See note 1.
Engine oil.....	A	B	303	328	A-200 (viscosity 200 secs, at 210°)		
Gear lubricant.....	A	B	303	328	G-9 (petroleum jelly)		
Spring lubricant.....	A	B	303	328	G-5 (calcium soap grease, consistency 82-145)		
Water pump grease.....	A	B	303	328	G-2½ (calcium soap grease, consistency 250-315)		
Wheel bearing grease.....	A	B	303	328			

ENGINE OIL RECOMMENDATIONS

Type of Service	Summer	Winter		
	All Temperatures Above 32° F.	Between 32° and 15° Above	Between 15° Above and 15° Below Zero	Below 15° Below Zero
Average Driving (No prolonged high speed driving)	S. A. E. viscosity 40 or 50	S. A. E. viscosity 20	S. A. E. viscosity 10 or S. A. E. viscosity 20 thinned with 1 qt. kerosene to 7 qts. oil	S. A. E. viscosity 10 thinned with 1 qt. kerosene to 7 qts. oil or S. A. E. viscosity 20 thinned with 2 qts. kerosene to 6 qts. oil
Prolonged High Speed Driving	<p style="text-align: center;">Cadillac Approved "Heavy Duty" Oils—Summer and Winter</p> <p style="text-align: center;">These are oils having an S. A. E. viscosity of 50—60 which are required to meet certain specifications as to volatility in order to demonstrate their fitness for prolonged high speed driving.</p> <p style="text-align: center;">NOTE: Approved lubricants vary in their suitability for winter use. If an oil with a high pour test is used in winter and the car is not kept in a heated garage, add from one to two quarts of kerosene after a long drive at high speed before the car is stored for the night. Also when draining the crankcase, add from one to two quarts of kerosene to the fresh oil, unless starting immediately on a long trip at high speeds.</p>			

1. Thinning Gear Lubricant with Kerosene

Gear lubricant for the transmission and differential need be thinned only at the beginning of cold weather if a sufficient quantity of kerosene is added to take care of the lowest expected temperature. The lubricant for the steering gear should not be thinned.

The steering gear should be lubricated the year round with A-200 lubricant, to which 5% Acheson No. 38 graphite may be added. It is very important that only Acheson No. 38 be used. This particular product is a very fine powdered graphite, and no other powdered graphite on the market is similar to it. Acheson Graphite may be procured direct from the Acheson Graphite Corporation Niagara Falls, New York.

2. Special Items for Lubrication Diagrams

The following items cannot be placed on the regular

1000-mile schedule, so they should be performed at the recommended intervals.

Every day—Check level of liquid in radiator.

Every week—Check tire pressure.

When cold weather starts—Thin engine oil with kerosene to permit easier cranking. Also thin lubricant in rear axle and transmission.

At beginning of warm weather—Drain thinned lubricant and replace with fresh lubricant.

Once each season—Remove spring covers (if used) and repack with petroleum jelly.

Every 12000 miles—Check level of special oil in shock absorbers.

Every 12000 miles—Replace oil filter cartridge. Remove and clean engine oil pan and screen at same time.

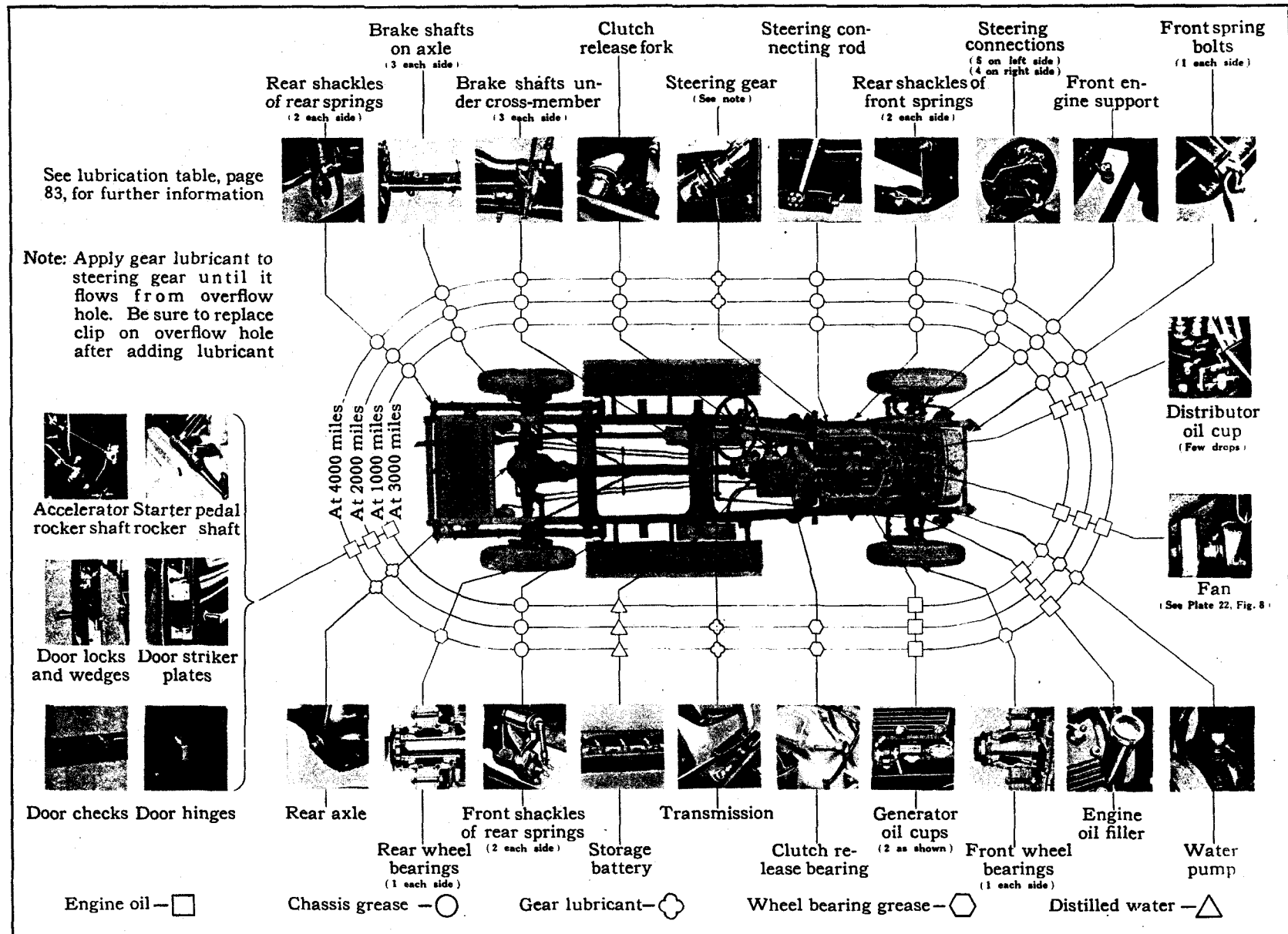
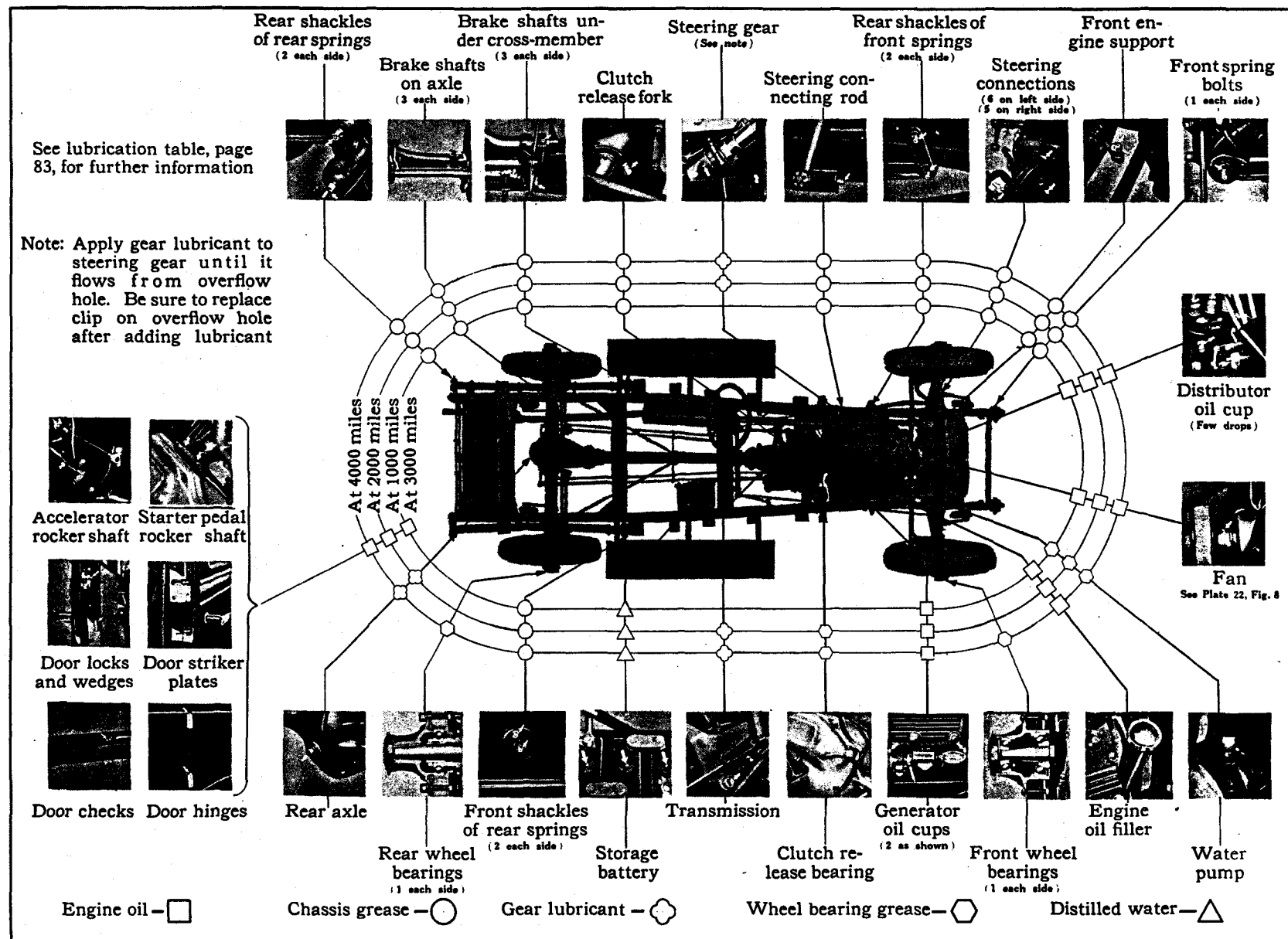
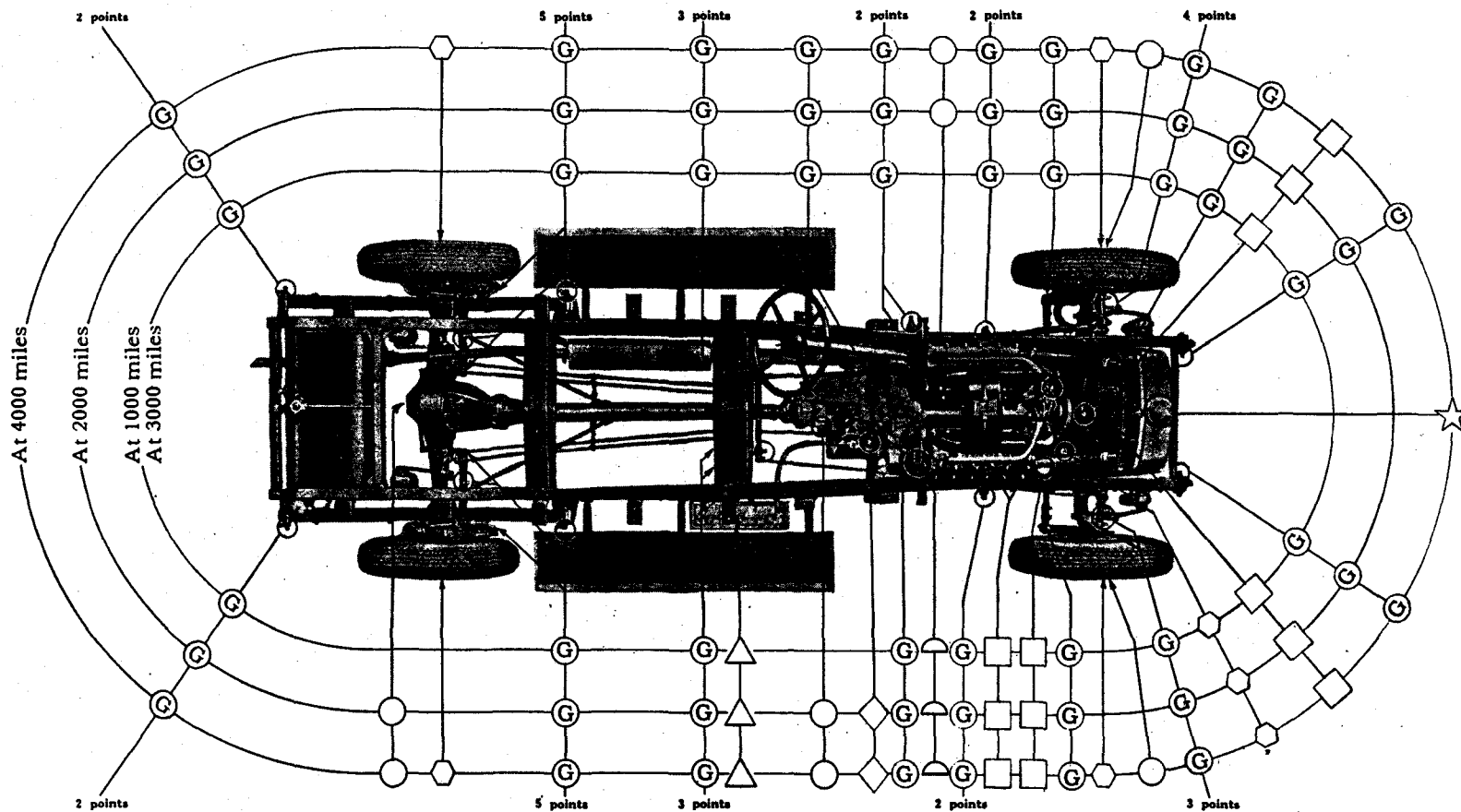


Plate 46. Lubrication diagram, Cadillac 341-B.

Plate 47. Lubrication diagram, La Salle 328.



Each "G" indicates a grease-gun connection



- Use engine oil ☐ Use wheel bearing grease ☐ Flush cooling system ☐ Add water to storage battery ☐
- Use chassis lubricant ☐ Use fibre grease ☐ Test oil filter ☐

Plate 48. Chassis lubrication diagram, Cadillac 341-A.

Each "G" indicates a grease-gun connection

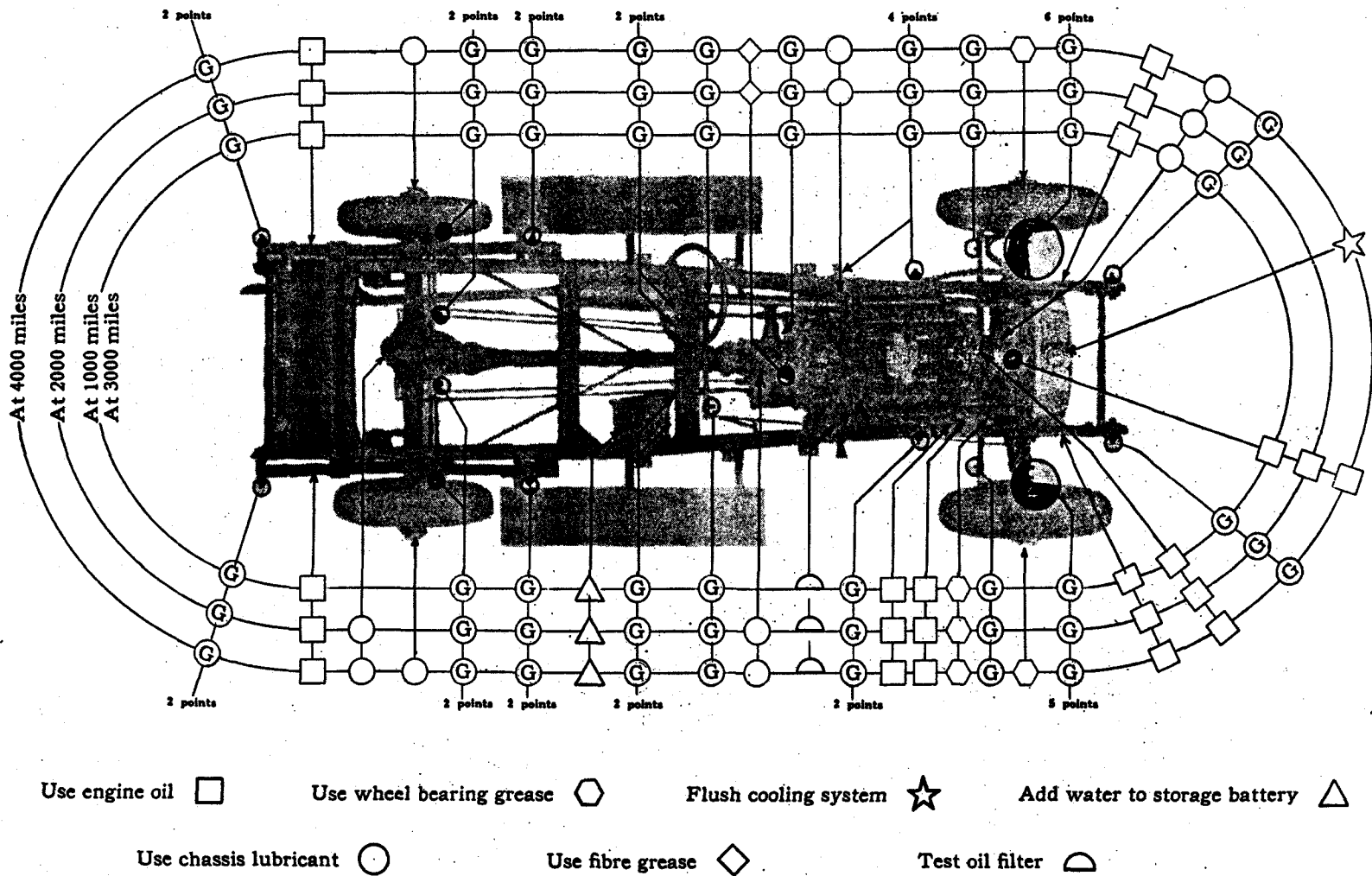


Plate 49. Chassis lubrication diagram, La Salle 303.

Springs and Shock Absorbers

Subject	Cadillac 341		LaSalle 303-328		Specifications	Remarks
SPRINGS						
Bolts, diameter of spring	A	B	303	328	.747-.748 in.	
Clearance between bolts and bushings.....	A	B	303	328	New limits, .001-.004 in. Worn limit, not over .006 in.	
Leaves, Number of—						
Front.....	A				10 Part No. 878718	Before chassis unit 3-22101 and beginning with chassis unit 3-25101.
		B			10 Part No. 878719	
					11 Part No. 878721	Beginning with chassis unit 3-22101 and before chassis unit 3-25101.
			303 ¹		8 Part No. 875915 R.H. } 8 Part No. 875916 L.H. }	Before chassis unit 2-15200
			303 ²	328	9 Part No. 875917 R.H. } 9 Part No. 875918 L.H. }	303: Beginning with chassis unit 2-15200. 328: Before chassis unit 4-00383.
				328	9 Part No. 871543 R.H. } 9 Part No. 871544 L.H. }	Beginning with chassis unit 4-00383.
Rear, standard.....	A				9 Part No. 878709	2-pass. cars.
	A	B			9 Part No. 878710	341-A: 4-pass. cars. 341-B: 2-pass. and 4-pass. cars.
	A	B			9 Part No. 878712	5-pass. cars.
	A	B			10 Part No. 878713	7-pass. cars.
			303 ¹		8 Part No. 875872	2-pass. cars.
			303 ¹		9 Part No. 875871	4-pass. cars (Except Town Sedan)
			303 ¹		10 Part No. 875870	5-pass. cars and Town Sedan.
			303 ¹		10 Part No. 875874	7-pass. cars.
			303 ²		8 Part No. 875871	2-pass. cars.
			303 ²	328	9 Part No. 875876	303: 4-pass. cars (Except Town Sedan) 328: 2-pass. Roadster. 2-pass. Coupe and Convertible Coupe before chassis unit 4-11035 and beginning with chassis unit 4-11678. 4-pass. Phaeton and Sport Phaeton before chassis unit 4-3875.
			303 ²	328	10 Part No. 875873	303: 5-pass. cars and Town Sedan. 328: 2-pass. Coupe and Convertible Coupe, beginning with chassis unit 4-11035 and before chassis unit 4-11678. 4-pass. Phaeton and Sport Phaeton, beginning with chassis unit 4-3875. 5-pass. Coupe. All other 5-pass. cars before chassis unit 4-3869.
			303 ²	328	11 Part No. 875877	303: 7-pass. cars. 328: 5-pass. cars beginning with chassis unit 4-3869 (except 5-pass. Coupe).
				328	11 Part No. 871600	7-pass. cars before chassis unit 4-2970. 7-pass. cars beginning with chassis unit 4-2971.

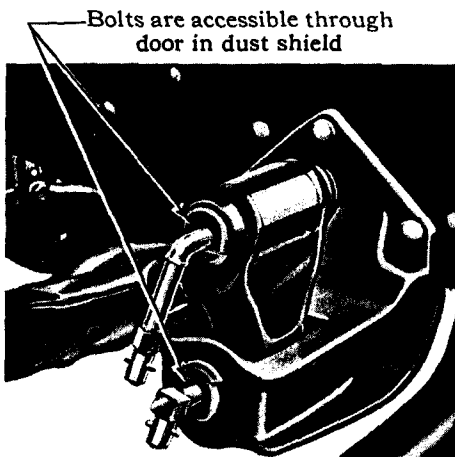


Fig. 1
Rear spring front shackle.
Cadillac 341-A

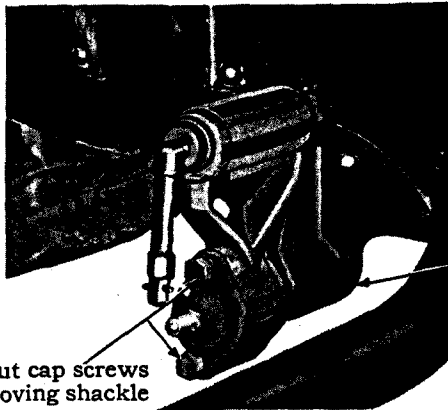
To remove bolt, use drift inserted through hole in dust shield



Hole in frame to facilitate removal of shackle

Use wrench 109200 on this nut

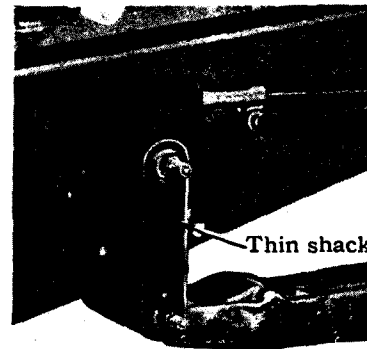
Fig. 2
Rear spring front shackle.
LaSalle 303 and 328



Turn out cap screws for removing shackle

Frame bracket

Fig. 3
Rear spring front shackle.
Cadillac 341-B



Thin shackle side

Fig. 4
Front spring rear shackle
Cadillac 341-B

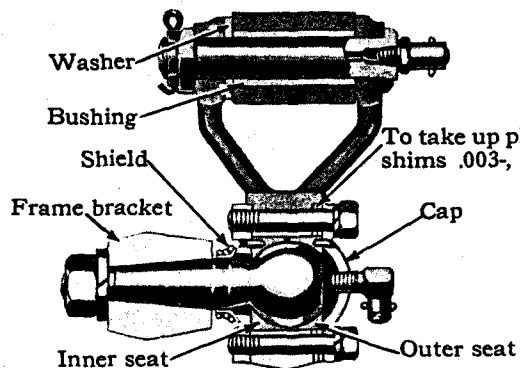


Fig. 5
Sectional view of rear spring shackle
Cadillac and LaSalle

To take up play in shackle pivot, use shims .003-, .005- or .015-inch thick

Nut must not be tight enough to bind spring

Floating sleeve

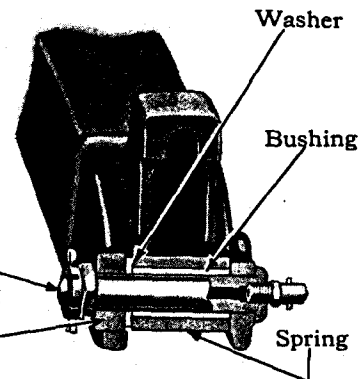


Fig. 6
Sectional view of front spring shackle.
Cadillac and LaSalle

SPRINGS AND SHOCK ABSORBERS

90A

Subject	Cadillac 341	LaSalle 303-328	Specifications			Remarks
Rear, special heavy.....	A	.....	9	Part No. 878710		2-pass. cars.
	A	.....	9	Part No. 878712		4-pass. cars.
	A	B	10	Part No. 878713		341-A: 5-pass. cars. 341-B: 2-pass. and 4-pass. cars.
	A	.....	10	Part No. 878715		7-pass. cars.
	.....	B	10	Part No. 878714		5-pass. cars.
	.....	B	10	Part No. 878716		7-pass. cars.
	.....	303 ¹	10	Part No. 875870		2-pass. and 4-pass. cars (except Town Sedan).
	.....	303 ¹	10	Part No. 875874		5-pass. cars and Town Sedan.
	.....	303 ¹	10	Part No. 875875		7-pass. cars.
	.....	303 ²	11	Part No. 875877		303: 2-pass. and 4-pass. cars (except Town Sedan). 328: 2-pass. and 4-pass. cars.
	.....	303 ²	12	Part No. 875878		303: 5-pass. cars and Town Sedan. 328: 5-pass. cars.
	.....	303 ²	12	Part No. 875879		7-pass. cars. See Note 1.
Length, center to center—						
Front.....	A	B	.....	42 in.		Spring in loaded position.
	.....	303	328	39 in.		
Rear.....	A	B	.....	60 in.		
	.....	303	328	58 in.		
Width—						
Front.....	A	B	.....	2¼ in.		
	.....	303	328	2 in.		
Rear.....	A	B	.....	2½ in.		
	.....	303	328	2 in.		
SHOCK ABSORBERS						
Metering pins for two-way Lovejoys—				Style	Part No.	Location
Present standard equipment for average speeds on paved city streets and good country roads						See Note 2.
All body styles.....	B	.....	328 ²	EX	829325	Front
				EX	829325	Rear
	B	.....	328 ²	8X	829323	Front
				9X	829324	Rear
High driving speeds on average roads.						
All body styles.....	B	.....	328 ²	CX	828425	Front
				CX	828425	Rear
	B	.....	328 ²	6X	828426	Front
				7X	828427	Rear
Speeds of 45 to 50 M. P. H. on rough roads and open ditches						
All body styles.....	B	.....	328 ²	AX	826776	Front
				AX	826776	Rear
	B	.....	328 ²	3X	827260	Front
				4X	827261	Rear
Speeds of 50 M. P. H. and up on rough roads and open ditches.						
All body styles with special heavy rear springs.....	B	.....	328 ²	AX	826776	Front
				BX	828197	Rear

SPRINGS AND SHOCK ABSORBERS

Subject	Cadillac 341	LaSalle 303-328	Specifications			Remarks
All 2-pass. cars and 4 and 7-pass. Phaeton cars with special heavy rear springs.....	B		5X 1X	827262 828196	Front Rear	Rebound pins
All 4 and 5-pass. Cadillac Coupes, 5 and 7-pass. Cadillac Sedans and La Salle 328 cars, with special heavy rear springs.....	B	328 ²	3X 1X	827260 828196	Front Rear	Rebound pin

1. Special Heavy Rear Springs

The standard rear springs with which Cadillac and LaSalle cars are equipped are designed to give the best riding qualities under the road conditions which predominate where the greatest number of cars are used. Special heavy rear springs to prevent bottoming at high speed on rough roads are supplied by the Parts Division as listed in the table.

The special heavy springs have $1\frac{1}{2}$ inches more arch than the standard springs. To compensate for this, special rear shock absorber equipment is necessary on cars equipped with special heavy springs.

In the absence of these special heavy rear springs, the standard rear springs can be stiffened by inserting extra leaves. Two extra leaves are recommended and these should be duplicates of the No. 3 leaf. When using extra leaves, it is necessary to use special length alignment clips and center bolts.

When using special heavy rear springs, it is also necessary to use longer clips to fasten the springs on the axle.

2. Metering Pins for Two-way Lovejoys

The metering pin equipment in two-way Lovejoy Shock Absorbers must be changed for different road conditions because it is impossible to secure ideal riding on all kinds of roads with the same metering pins. In each case, it is necessary to determine what sort of driving prevails and change the metering pins accordingly.

The present factory standard equipment for all body styles, on both Cadillac and LaSalle cars, is EX bumper pins, and 8X and 9X rebound pins on the front and rear shock absorbers, respectively. This equipment is standard because paved city streets and good country roads predominate.

Bumper pins are used in the bumper cylinder which is on the side of the shock absorber away from the lever.

Rebound pins are used in the rebound cylinder which is on the side of the shock absorber toward the lever.

Two-way Lovejoys are supplied as special equipment for first type LaSalle 328 cars.

Steering Gear

Subject	Cadillac 341		LaSalle 303-328		Specifications	Remarks
Angle of column—						
Closed cars.....	A	...	303	....	42° 10'	
	B	....		....	42° 25'	
			328		44° 28'	
Open cars.....	A ¹	....		....	40°	
	A ²	....		....	40° 55'	
			303		42° 10'	
	B	....		....	41° 10'	
			328		42° 15'	
Clearance between steering tube (worm shaft) and bush- ings.....	A	B	303	328	.002—.004 in.	
Clearance between sector shaft and eccentric bushing.....	A	B	303	328	.001—.003 in.	
Diameter of steering wheel...	A	B	...	...	19 in.	
			303	328	18 in.	
Ratio.....	A	...		...	16 to 1	Ratio of degrees movement of steering wheel to degrees movement of front wheel spindle.
	B	....		....	14.95 to 1	
			303		17.5 to 1	
			328		16.15 to 1	
Steering connecting rod-springs						
Free length.....	A	B	303	328	1 in.	
Compression.....	A	B	303	328	325—400 lbs. compressed to 3/8 in.	
Turning radius, left.....	A	B	...	...	25 ft.— 1 in.	Radius of circle swept by outside wall of tire. W. B.—Wheelbase.
			303	328	20 ft.— 8 in., 125 in. W. B.	
					22 ft.—10 in., 134 in. W. B.	
Turning radius, right.....	A	B	...	...	23 ft.— 0 in.	
			303	328	19 ft.— 7 in., 125 in. W. B.	
					21 ft.—1 1/2 in., 134 in. W. B.	
Unit number, location of.....	A	B	303	328	Top face of steering gear housing, all models	

First-type screw. If looseness occurs, install second-type fillister-head screw with same number of threads

Second-type fillister head screw

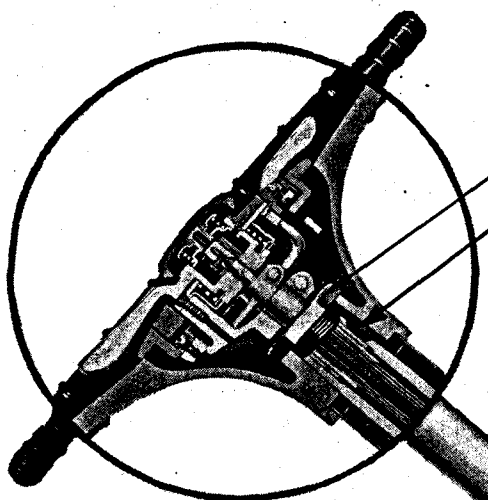
Spider

First-type plug. To install second-type plug, thread counterbore with 1/2-20 (S. A. E.) right-hand tap

Second-type threaded plug

To install fillister-head screw, counterbore to metal core with flat-end, 7/16-inch drill

Fig. 2
Sectional view of steering wheel rim



Retaining nut

Key

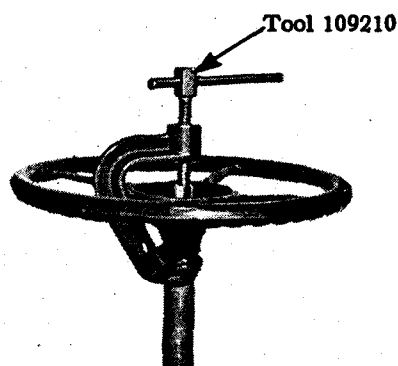


Fig. 3
Steering wheel puller

Eccentric sleeve

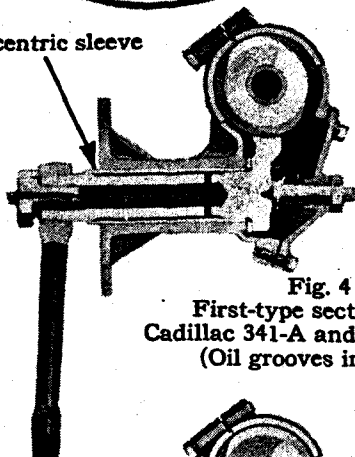


Fig. 4
First-type sector shaft.
Cadillac 341-A and LaSalle 303
(Oil grooves in shaft)

Eccentric sleeve

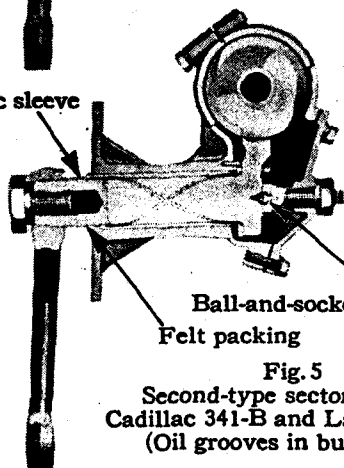
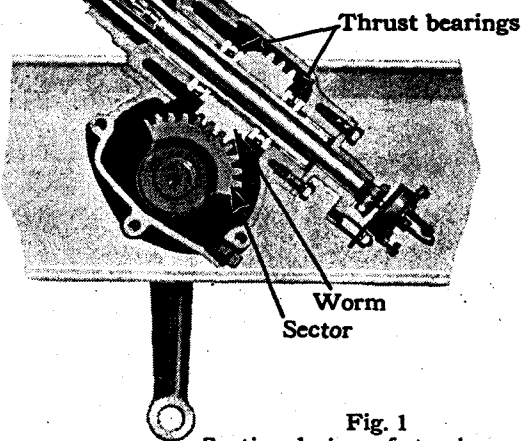


Fig. 5
Second-type sector shaft.
Cadillac 341-B and LaSalle 328
(Oil grooves in bushing)

Ball-and-socket swivel on adjusting screw

Felt packing



Thrust bearings

Worm
Sector

Fig. 1
Sectional view of steering gear

Note: Adjustment of steering connections, knuckle bolts and wheel bearings, inspection of steering cross rod and connecting rod springs, and checking caster and alignment of front wheels should precede adjustment of steering gear. Remove steering connecting rod before adjusting steering gear

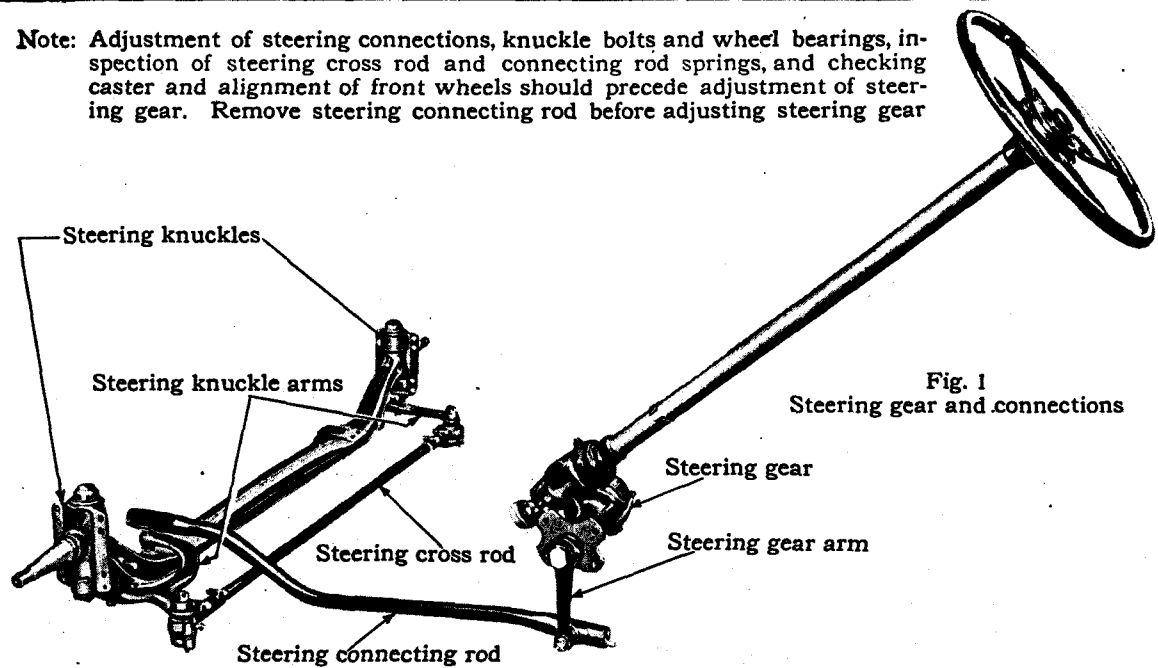


Fig. 1
Steering gear and connections

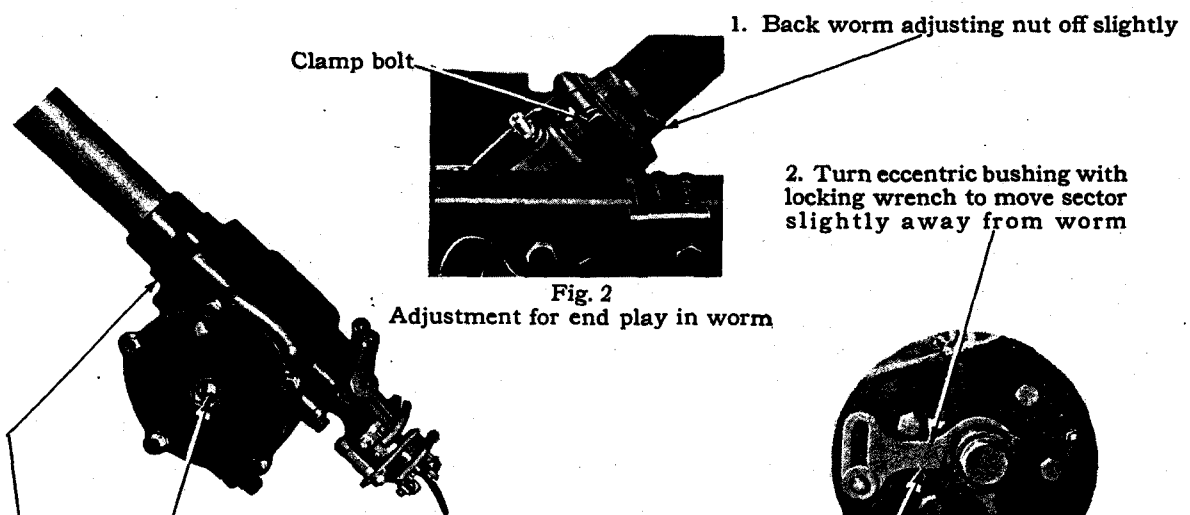


Fig. 2
Adjustment for end play in worm

Fig. 3
Adjustment for end play in sector shaft

3. Turn adjusting screw in against sector until all play is taken up and slight binding is felt when turning steering wheel; then back off just enough to free adjustment. Move steering wheel back and forth while making this adjustment in order to insure alignment of swivel on sector adjusting screw
4. Turn worm adjusting nut down until all play is taken up and slight binding is felt when turning steering wheel; then back off just enough to free adjustment

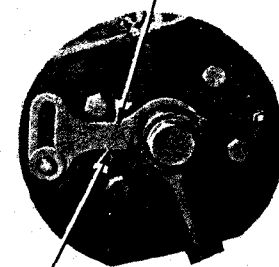


Fig. 4
Eccentric bushing adjustment

5. Move locking wrench to move sector toward worm until all backlash is taken up and slight binding is felt when turning steering wheel; then back off just enough to free adjustment on high point of sector
- Note:** If front wheels do not point straight ahead when worm is on high point of sector, change position of steering arm on sector shaft

Plate 52. Steering gear adjustments and steering connections.

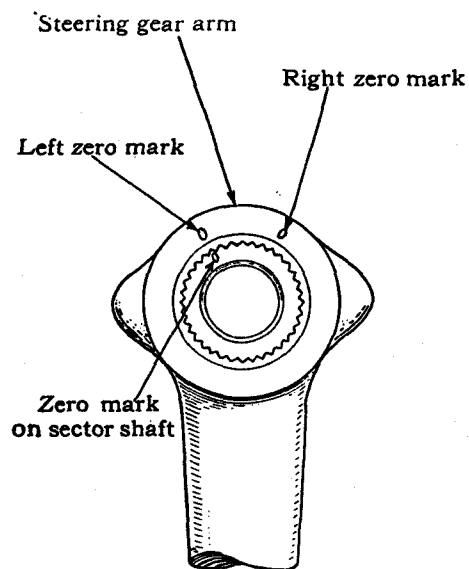


Fig. 1
Zero marks on steering gear arm and sector shaft (left-hand steering)
Zero mark on arm must line up with zero mark on shaft to insure getting worm on high point of sector. On cars with left-hand steering, use left zero mark; on cars with right-hand steering, use right zero mark

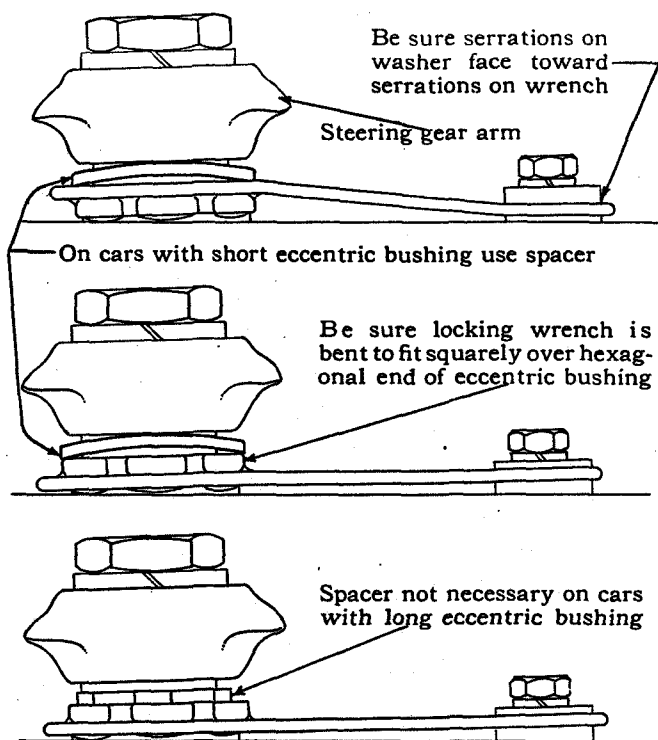


Fig. 2
Views showing installation of locking wrench on hexagonal end of eccentric bushing

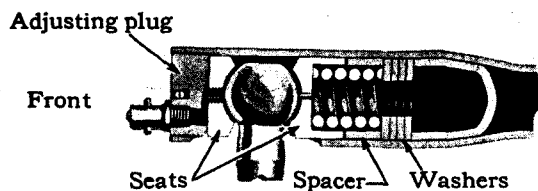


Fig. 3
Sectional view of steering connecting rod. Cadillac 341-A and B

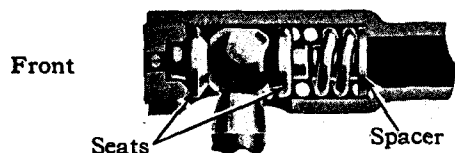
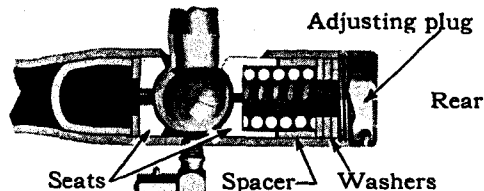


Fig. 4
Sectional view of steering connecting rod. LaSalle 303, first type

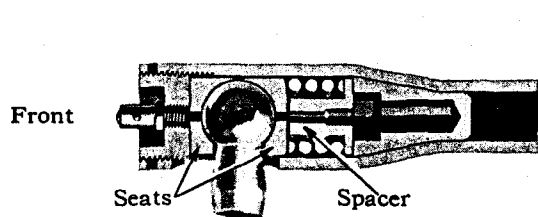
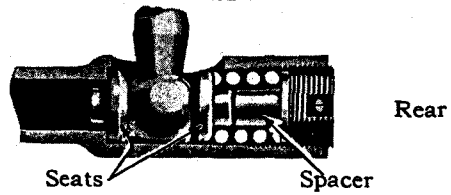
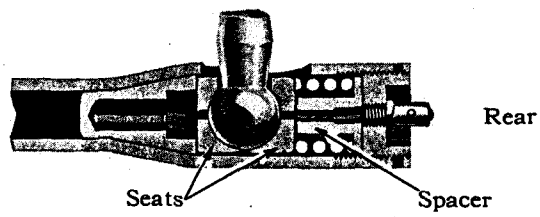


Fig. 5
Sectional view of steering connecting rod. LaSalle 303, second type, and 328



Transmission and Universal Joint

Subject	Cadillac 341		LaSalle 303-328		Specifications	Remarks	
TRANSMISSION							
Gear ratio, low gear.....	A	B	303	328	3.125 to 1	See capacities under Lubrication Table, Page 83.	
Gear ratio, second gear.....	A	B	303	328	1.705 to 1		
Gear ratio, high gear.....	A	B	303	328	1 to 1 (Direct drive)		
Gear ratio, reverse gear.....	A	B	303	328	3.745 to 1		
Lubricant.....	A	B	303	328	Chassis lubricant A-200		
Lubricant, amount required...	A	B	303	328	.....	
Unit number, location.....	A	B	303	328	On center of left flange next to flywheel housing		
JACKSHAFT GEAR ASSY							
End play of gear unit.....	A	.....	.....	.....	New limits, .001-.009 in. Worn limit, not over .015 in.
			303	.....	New limits, .012-.022 in. Worn limit, not over .025 in.	
		B	.....	328	New limits, .001-.011 in. . Worn limit, not over .025 in.	
Play in jackshaft bearings....	A	B	303	328	Worn limit, not over .007 in.		
MAIN SHAFT ASSEMBLY							
Clearance between second speed gear and bushing.....	B	328	New limits, .002-.004 in. Worn limit, not over .006 in.	In 341-B and 328 cars, these limits apply only to low-and-reverse shifter gear.	
Clearance between splines on main shaft and splineways of bushing in second speed gear...	.....	B	.....	328	New limits, .001-.005 in. Worn limit, not over .008 in.
Clearance between splines on main shaft and splineways in shifter gears.....	A	B	303	328	New limits, .001-.003 in. Worn limit, not over .005 in.		
Clearance between splines on main shaft and splineways in sliding gear coupling.....	.....	B	.....	328	New limits, .001-.003 in. Worn limit, not over .005 in.
Clutch connection shaft, out of true.....	A	B	303	328	Not over .0025 in.		
End play between clutch con- nection shaft and main shaft...	.....	B	.....	328	New limits, .001-.012 in. Worn limit, not over .020 in.
End play in clutch connection shaft rear bearing.....	A	...	303	.....	Not over .015 in.	
End play in main shaft rear bearing.....	A	...	303	.....	Not over .015 in.	
Main shaft, out of true.....	A	B	303	328	Not over .0025 in.		
Shake between clutch connec- tion shaft and main shaft...	A	B	303	328	Not over .006 in.		
REVERSE PINION GEAR ASSEMBLY							
Clearance between reverse pin- ion shaft and bushing.....	A	B	303	328	New limits, .001-.003 in. Worn limit, not over .004 in.		

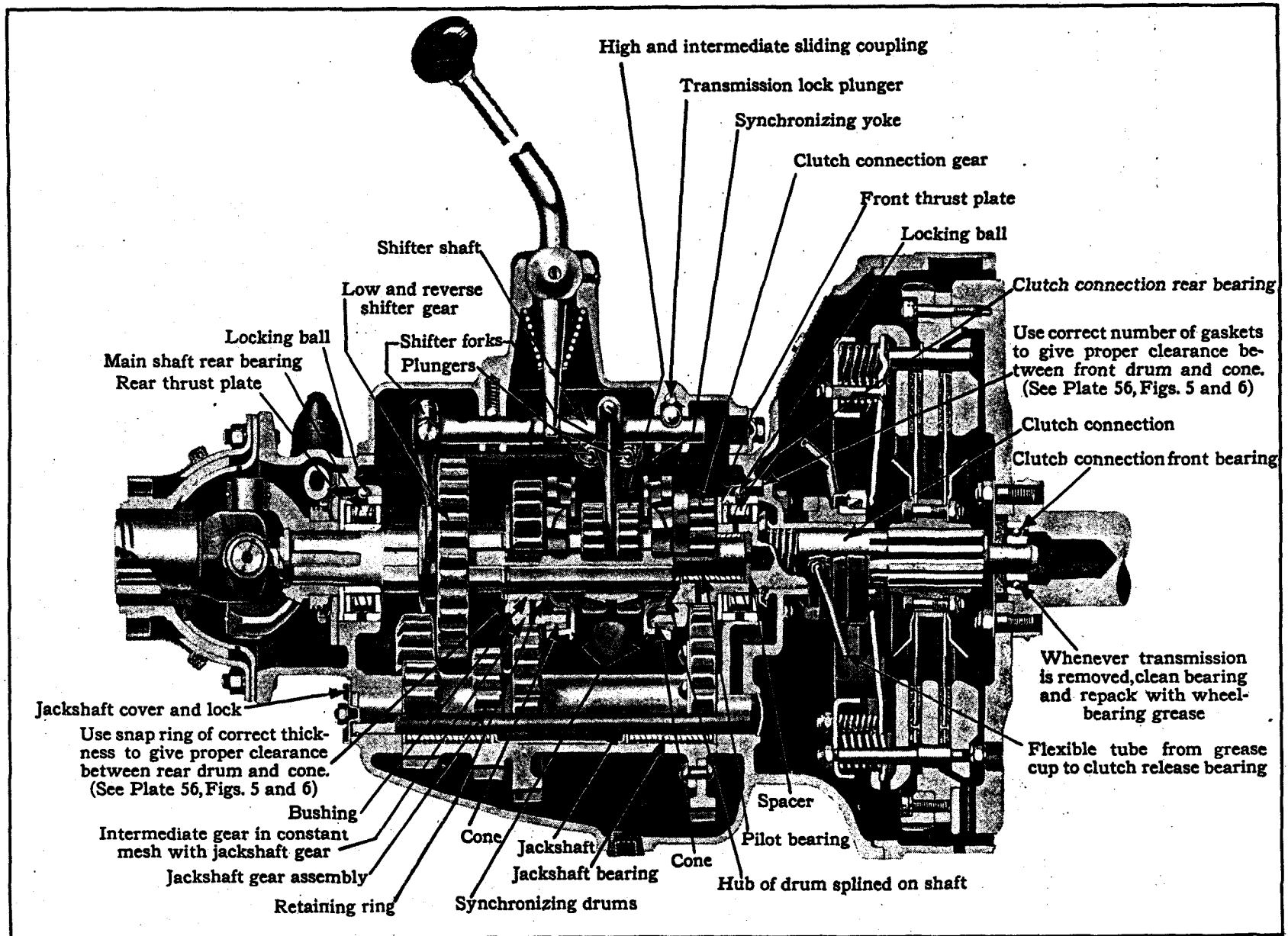


Plate 53. Sectional view of transmission, Cadillac 341-B and La Salle 328.

Subject	Cadillac 341		LaSalle 303-328		Specifications	Remarks
End play in reverse pinion....	A	...	303	....	New limits, .010-.022 in. Worn limit, not over .025 in.	
	...	B	....	328	Worn limit, not over .025 in.	
Reaming size for reverse pinion bushing.....	A	B	303	328	.937-.938 in.	
SHIFTING MECHANISM						
Clearance between shifter fork and shifter gear.....	A	...	303	....	New limits, .010-.017 in. Worn limit, not over .025 in.	
	...	B	....	328	New limits, .020-.027 in. Worn limit, not over .035 in.	
Shifter shaft lock spring, free length.....	A	...	...	...	1 $\frac{1}{8}$ in., approximately	
	...	...	303	....	1 $\frac{1}{8}$ in., approximately	
	...	B	....	328	1 $\frac{1}{8}$ in., approximately	
Shifter shaft lock spring, com- pression.....	A	...	...	...	24-26 lbs. at 1 in.	
	...	...	303	....	24-26 lbs. at 1 $\frac{1}{4}$ in.	
	...	B	....	328	20-23 lbs. at $\frac{3}{4}$ in.	
YOKE ASSEMBLY						
Clearance between guide block and drum.....	...	B	....	328	New limits, .002-.006 in. Worn limit, not over .010 in.	
Clearance between plunger and yoke bore.....	...	B	....	328	New limits, .001-.003 in. Worn limit, not over .005 in.	
Plunger main spring, free length .....	...	B	....	328	1 $\frac{3}{4}$ in., approximately	
Plunger main spring, compres- sion.....	...	B	....	328	24-26 lbs. at $\frac{1}{8}$ in.	
Plunger valve spring, free length.....	...	B	....	328	$\frac{5}{8}$ in., approximately	
Plunger valve spring, compres- sion.....	...	B	....	328	2 $\frac{3}{4}$ -3 $\frac{1}{4}$ lbs. at $\frac{1}{8}$ in.	
Yoke return springs, free length	...	B	....	328	1 $\frac{1}{8}$ in., approximately	
Yoke return springs, compres- sion.....	...	B	....	328	14-16 lbs. at $\frac{1}{8}$ in.	
Yoke throw from neutral to applied position.....	...	B	....	328	New limits, $\frac{1}{8}$ - $\frac{1}{4}$ in. Worn limit, not over $\frac{1}{4}$ in.	Measured at top of transmission case, Plate 56, Fig. 5.
SPEEDOMETER GEARS						Driving Gear Driven Gear
32 x 6.75 (7.00/20) TIRES						No. of Teeth No. of Teeth
4.39:1 gear ratio.....	A	...	...	...	7	See notes 1, 2, 3 and 4
	...	B	....	...	7	Part Number Rolling radius
	A	...	...	...	7	878207
	...	B	....	...	7	878208
						848176
						848123
	A	...	...	...	7	878207
	...	B	....	...	7	877088
						848176
						848122
	A	...	...	...	7	878207
	...	B	....	...	7	878209
						848176
						848178

TRANSMISSION AND UNIVERSAL JOINT

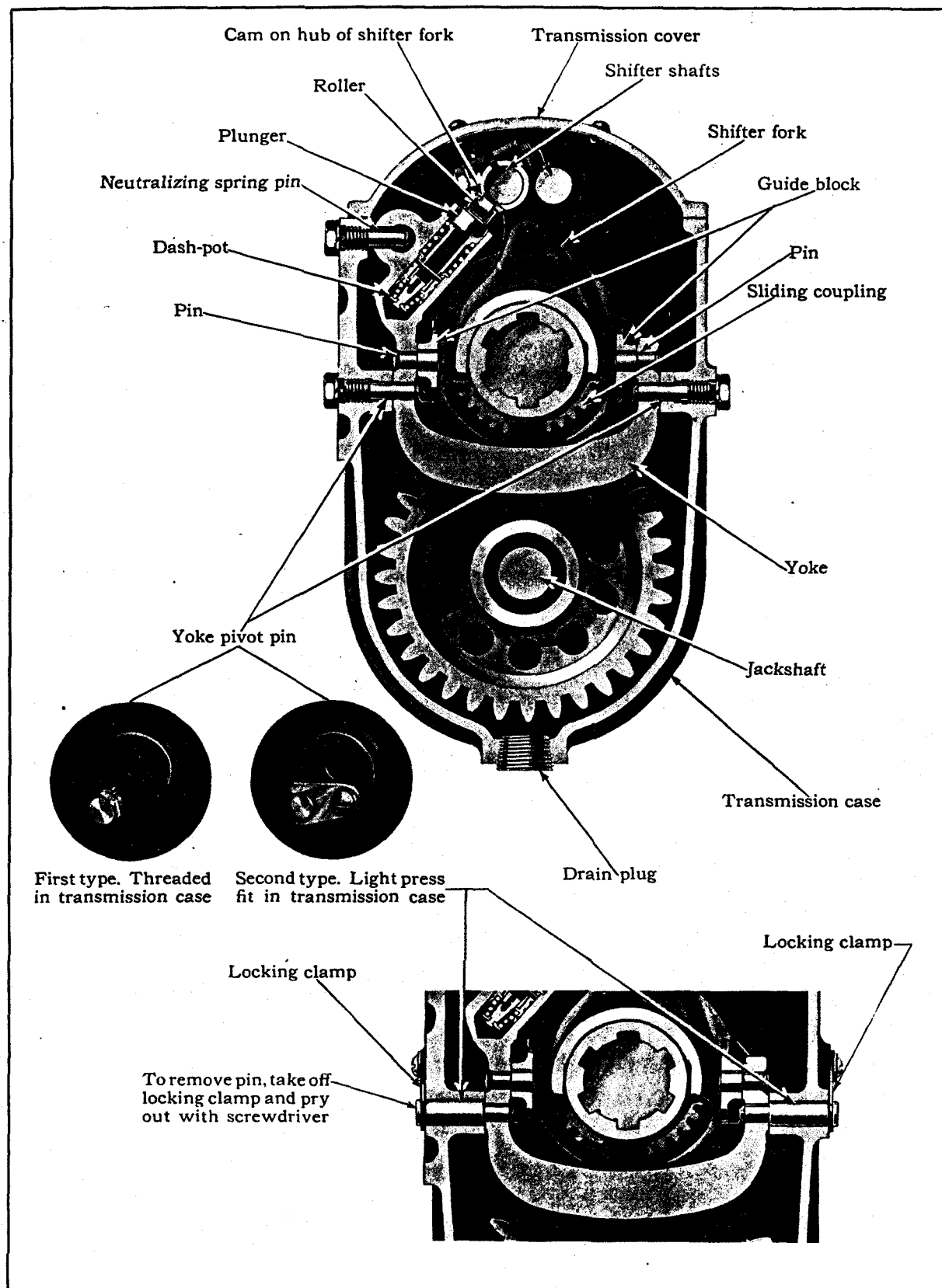


Plate 54. Cross-sectional view of transmission, Cadillac 341-B and
La Salle 328.

February, 1929

TRANSMISSION AND UNIVERSAL JOINT

98-A

Subject	Cadillac 341		LaSalle 303-328	Specifications		Remarks	
				Driving Gear No. of Teeth	Driven Gear No. of Teeth	See notes 1, 2, 3 and 4 Part Number	Rolling radius
4.75:1 gear ratio.....	A	7		878207	} 14 $\frac{5}{8}$ to 15 $\frac{3}{8}$ in.
		B	.....	7	22	876259
			.....		22	848176
			.....		22	848124
	A	7		878207	} 15 $\frac{3}{8}$ to 16 $\frac{1}{4}$ in.
		B	.....	7	21	878208
			.....		21	848176
			.....		21	848123
5.08:1 gear ratio.....		B	7		848176	} 15 $\frac{1}{8}$ to 15 $\frac{3}{4}$ in.
			.....		23	848125
	A	.....	.....	7		878207
		B	.....	7	22	876259
32 x 6.20 (6.30/20) TIRES				22	848176	} 15 $\frac{3}{4}$ to 16 $\frac{1}{8}$ in.
			.....		22	848124
						
						
4.17:1 gear ratio.....			303	7		876267	} 15 $\frac{3}{8}$ to 16 $\frac{1}{4}$ in.
			303 ¹		18	876351	
			303 ²		18	876374	
						
4.54:1 gear ratio.....			303	7		874375	} 15 $\frac{1}{8}$ to 16 $\frac{1}{8}$ in.
			.....		20	877088
						
						
4.916:1 gear ratio.....			303	7		874375	} 16 $\frac{1}{8}$ to 16 in.
			303 ¹		22	876226	
			303 ²		22	876259	
						
32 x 6.00 (6.00/20) TIRES						} See note 1.
						
						
						
4.07:1 gear ratio.....			303	7		874375	} 15 $\frac{3}{8}$ to 16 $\frac{1}{4}$ in.
			303 ¹		18	876351	
			303 ²		18	876374	
						
4.54:1 gear ratio.....			303	7		874375	} 14 $\frac{1}{4}$ to 15 $\frac{3}{8}$ in.
			303 ¹		21	874374	
			303 ²		21	876258	
						
4.916:1 gear ratio.....			303	7		874375	} 15 $\frac{1}{8}$ to 16 in.
			303 ¹		22	876226	
			303 ²		22	876259	
						
			303	7		874375	} 16 to 16 $\frac{3}{4}$ in.
			303 ¹		21	874374	
			303 ²		21	876258	
						
31 x 6.20 (6.50/19) TIRES						} See note 1.
						
						
						
4.07:1 gear ratio.....			328	7		848170	} 15 $\frac{1}{8}$ to 16 in.
			.....		18	876374
			328	7		848176	} 14 $\frac{5}{8}$ to 15 $\frac{3}{8}$ in.
			.....		19	848178
			328	7		848176	} 15 $\frac{3}{8}$ to 16 $\frac{1}{4}$ in.
			.....		18	876374
						
						
4.54:1 gear ratio.....			328	7		848176	} 14 $\frac{1}{4}$ to 15 $\frac{3}{8}$ in.
			.....		21	848123
						
						
			328	7		848176	} 15 $\frac{1}{8}$ to 16 $\frac{1}{8}$ in.
			.....		20	848122

TRANSMISSION AND UNIVERSAL JOINT

Subject	Cadillac 341		LaSalle 303-328		Specifications	Remarks
					Driving Gear No of Teeth	Driven Gear No of Teeth
4.916:1 gear ratio.....				328	7	23
				328	7	22
UNIVERSAL JOINT						
Ball and socket joint, adjustment.....	A	B	303	328	Remove gaskets until friction can be felt in joint, then add one gasket	
Ball member bushing, assembly	A	B	303	328	Oil grooves must cross on right side and open toward top and bottom of ball	
Clearance between crosses and bushings.....	A	B	303	328	New limits, .0025-.004 in. Worn limit, not over .006 in.	
Clearance between yoke and ball member bushing.....	A	B	303	328	New limits, .005-.007 in. Worn limit, not over .010 in.	

1. Speedometer Drive and Driven Gears

Two types of driven gears are listed for LaSalle 303 cars. The first type gears (874374-876226) are for transmissions before unit 2-5781, and the second type gears (876258-876259) are for transmissions after this unit number.

Beginning with transmission unit 2-5781, the speedometer cable is smaller in diameter, so that a gear with a smaller hole is required.

All driving gears have seven teeth but differ in lead and pitch. Driven gears with 18 and 22 teeth give slightly fast readings with 32 x 6.00 tires and slightly slow readings with 32 x 6.20 tires.

2. Installation of Cable Flange

On 341-A and 303 cars the distance between the centers of the driving gear and driven gear is the same for all combinations. On 341-B and 328 cars, two different center distances are used, one for pinions with 16 to 19 teeth and one for pinions with 20 to 23 teeth. In order to make this possible, the end of the speedometer cable is eccentric. In one position, the cable gives the correct center distance for pinions with 16 to 19 teeth. When revolved 180° the cable gives the correct center distance for pinions with 20 to 23 teeth. The flange of the cable end has the figures "16-19" on one side and "20-23" on the other side. The cable should always be turned so that the figures corresponding to the number of teeth on the pinion are on top.

3. United States Tires with Narrow Face

Driven gears 876374, 848122 and 848124 are for use only on La Salle 328 cars when narrow tread United States Tires are used.

4. Determining Correct Speedometer Gear by Rolling Radius

There are occasionally owners who desire to install on their cars tires of a different make from standard, or tires of special sizes. Any change in the make or sizes of the tires affects the speedometer reading and, in many cases, a new speedometer gear will be necessary.

It is impossible to specify the correct gear merely from the nominal size of the tire. Tires of various makes differ. It is necessary to know the "rolling radius" in order to determine the correct speedometer gear.

To find the rolling radius of any tire, simply measure the distance from the center of the hub cap of a rear wheel to the pavement.

Before doing this, however, make sure that the tires are inflated to the normal pressure of 40 pounds and that the car is weighed down to its normal load.

Once the rolling radius is known, the correct gear can be determined by referring to the specification table.

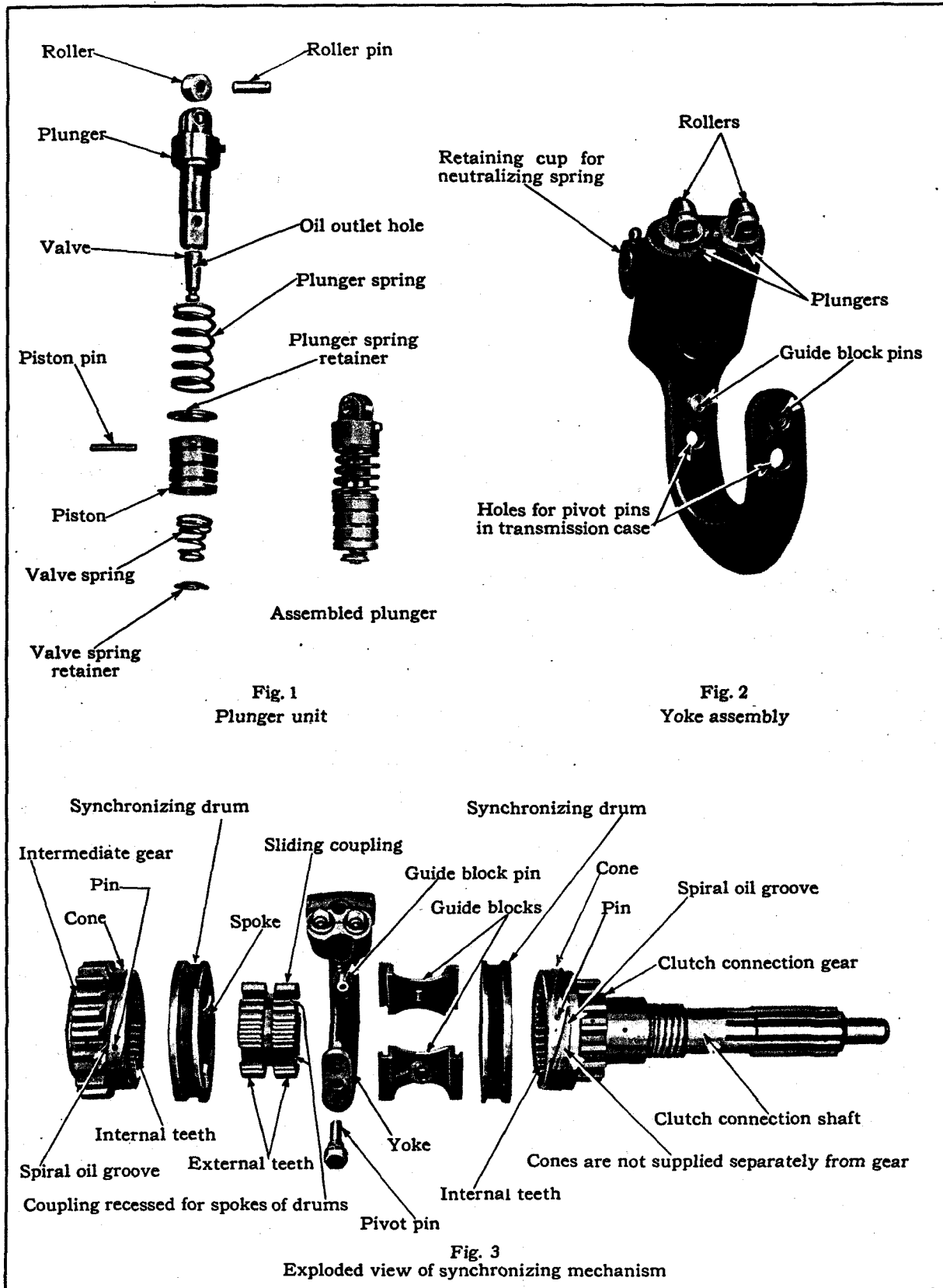


Plate 54A. Transmission synchronizing mechanism.

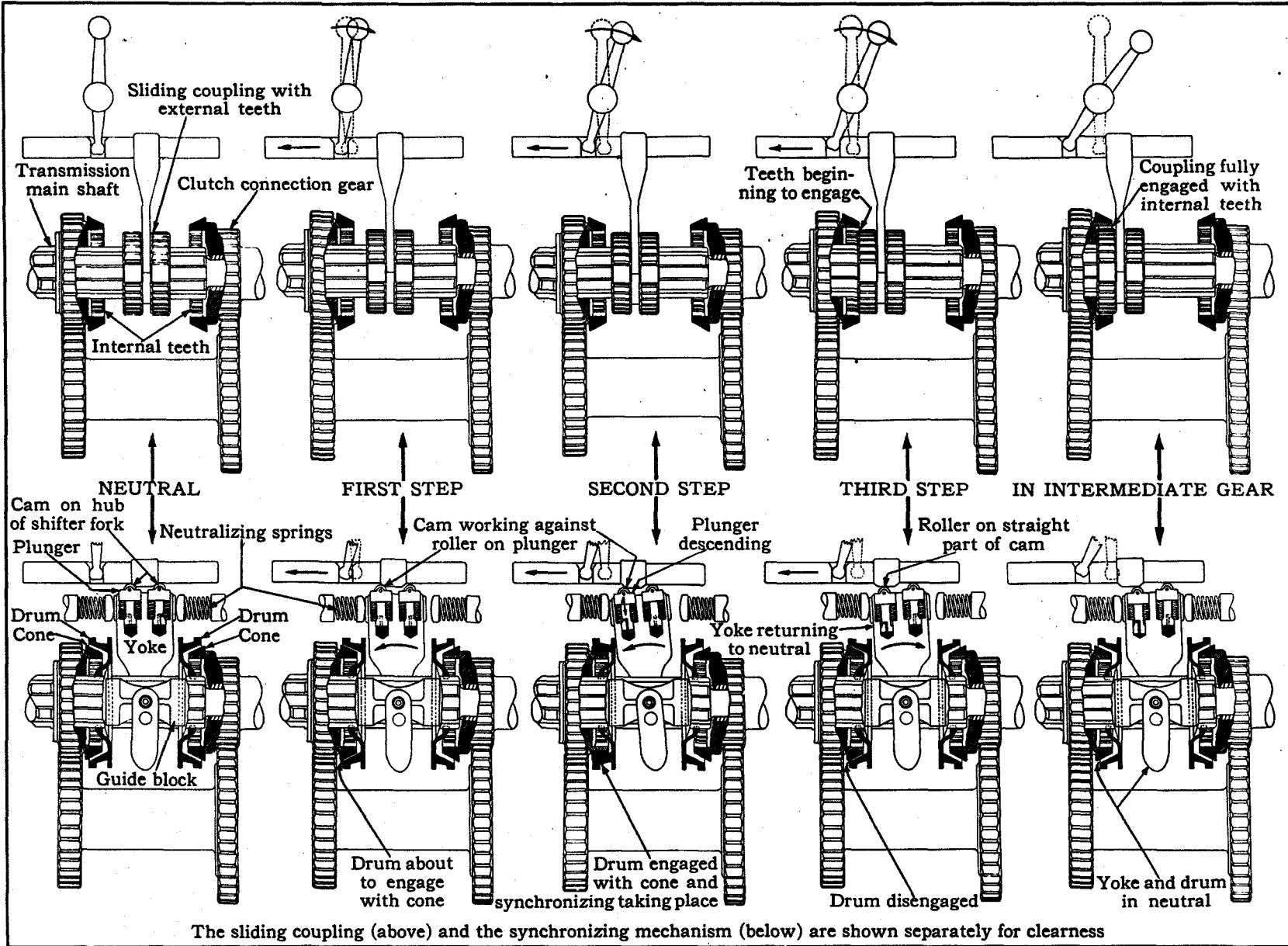


Plate 55. Diagrams showing operation of synchronizing mechanism.
(Neutral to intermediate).

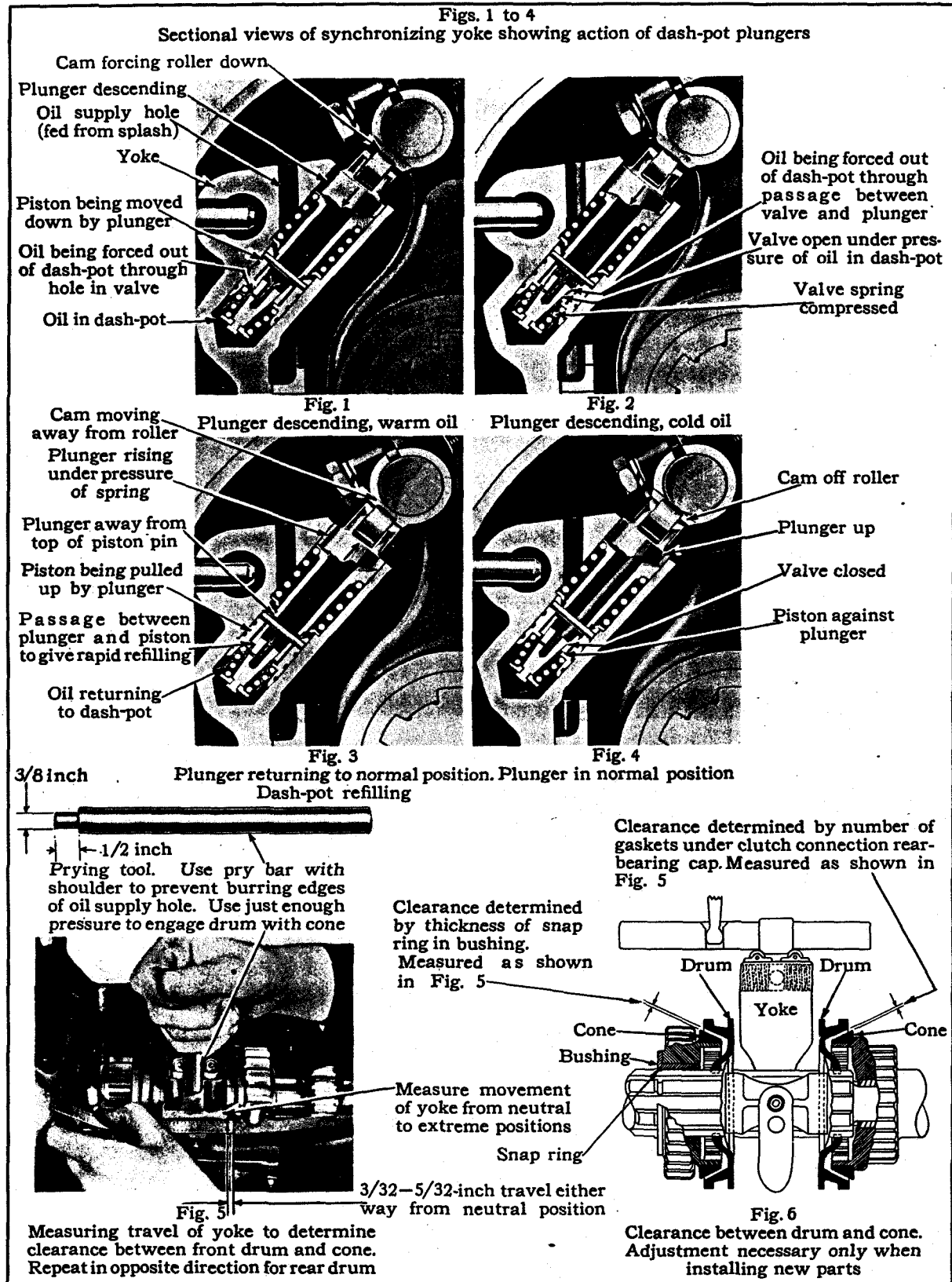


Plate 56. Dash pot operation and drum clearances.

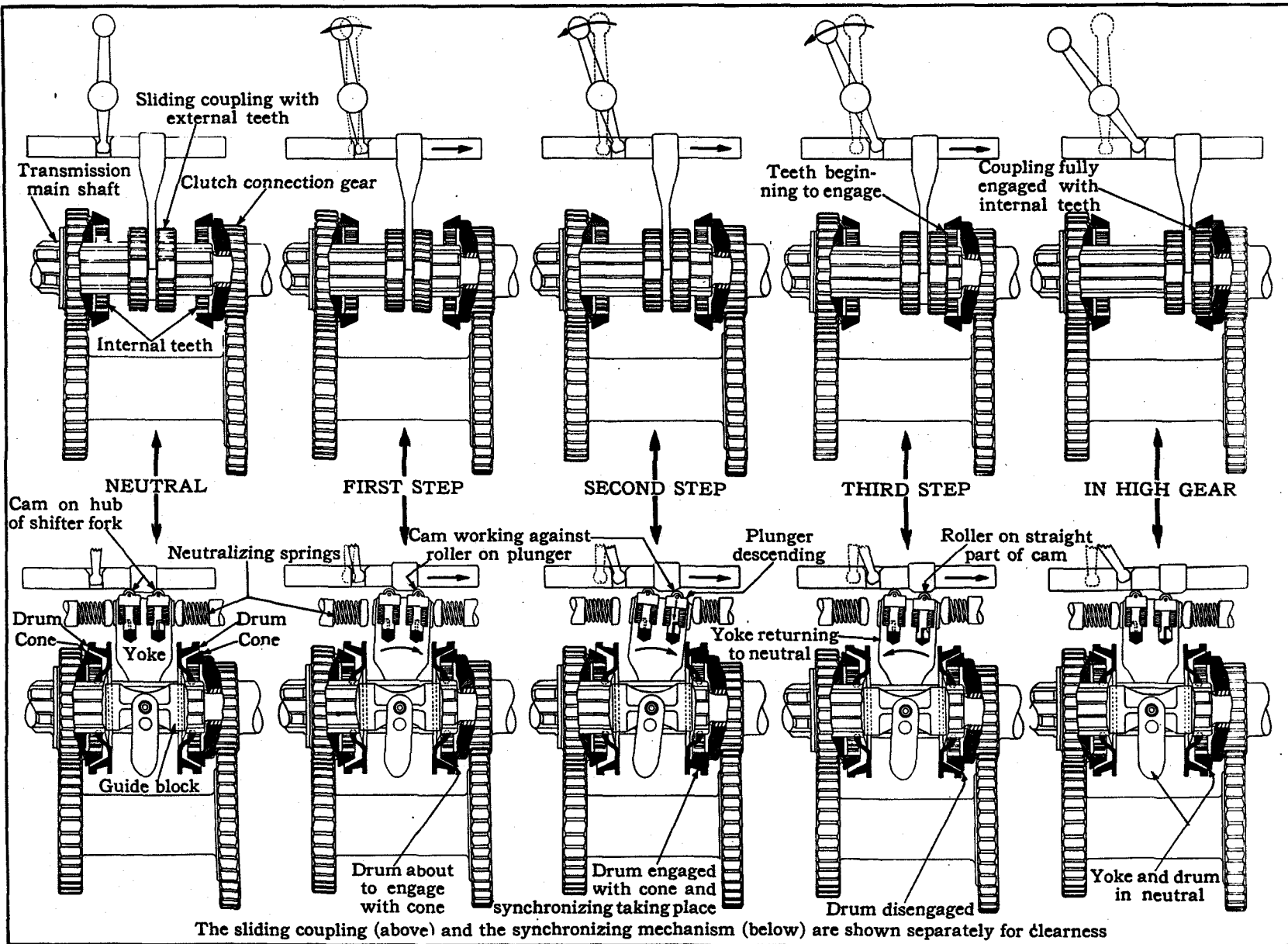


Plate 57. Diagrams showing operation of synchronizing mechanism.
(Neutral to direct drive).

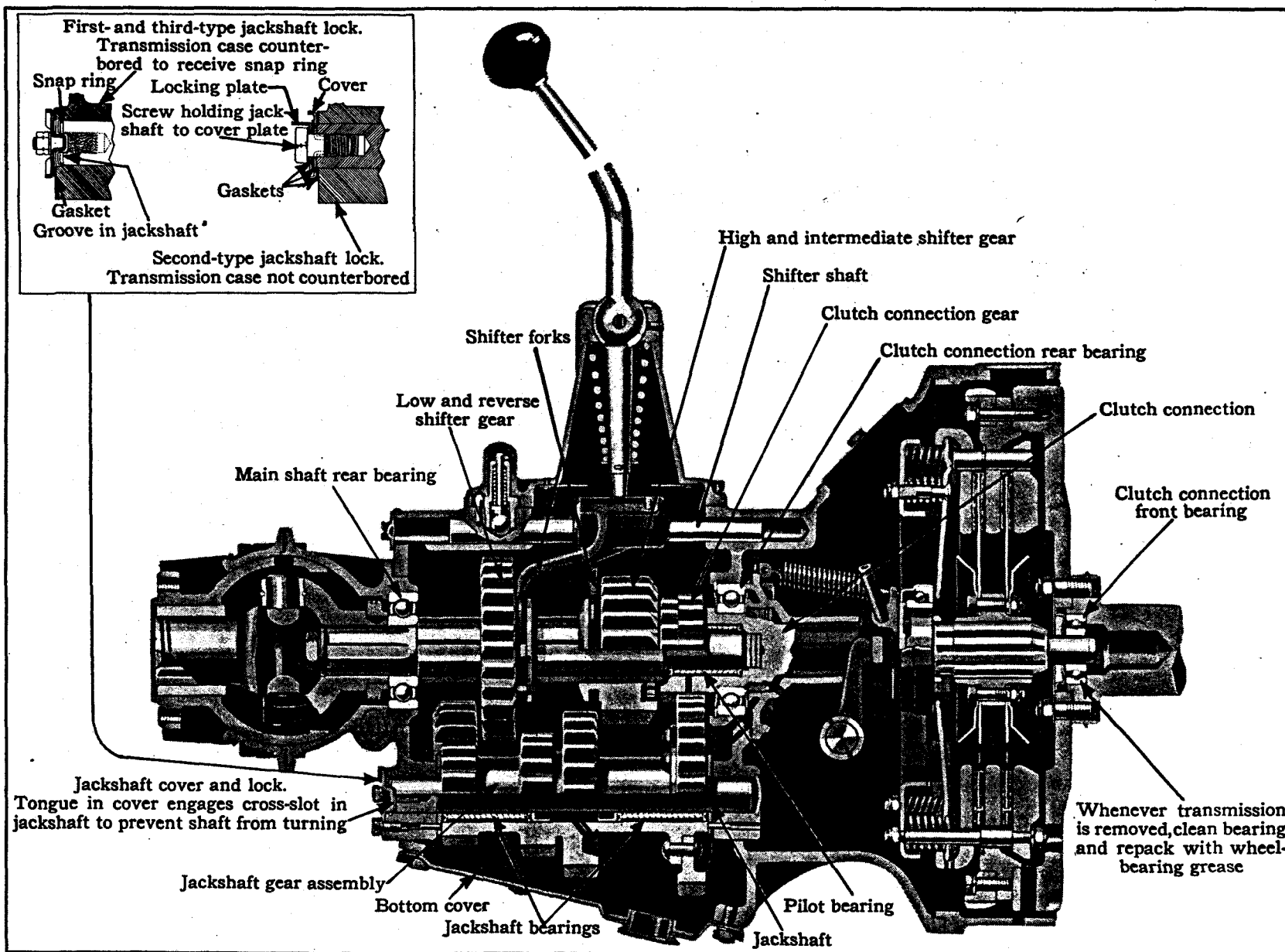


Plate 58. Sectional view of Cadillac 341-A transmission.

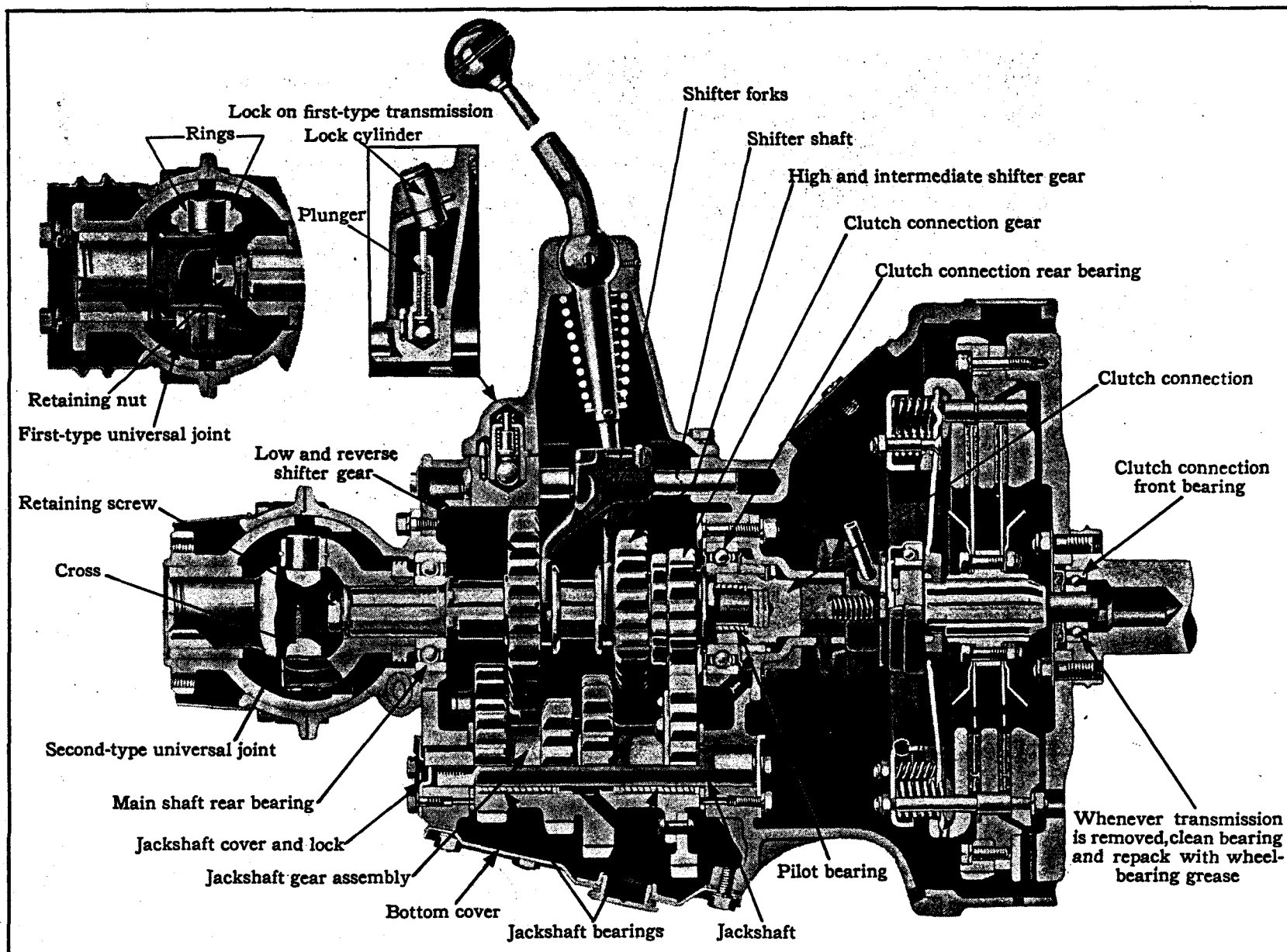


Plate 59. Sectional view of La Salle 303 transmission.

Figs. 1 and 2
Dowel pins are necessary for guiding the transmission during its removal and installation to prevent springing the clutch discs.
Cadillac 341-A and LaSalle 303 with plate clutch



Fig. 1
First-type detachable dowel pin

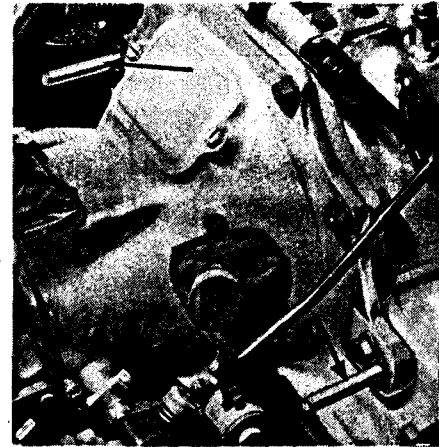


Fig. 2
Second-type permanent dowel pins

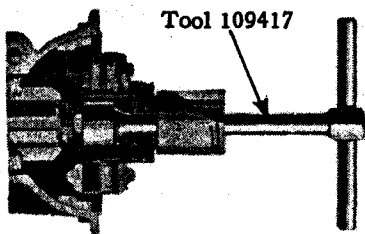


Fig. 3
Wrench for removing universal joint retaining nut.
Use wrench 109217 for second-type joint with retaining screw

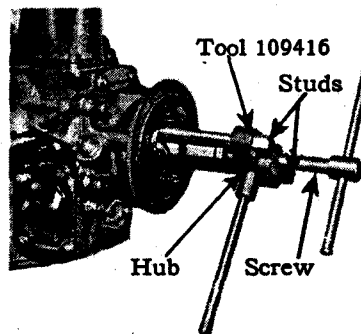


Fig. 4
Universal joint puller.
Use adapters in place of studs for Cadillac 341-A and B; LaSalle 303, second type, and 328

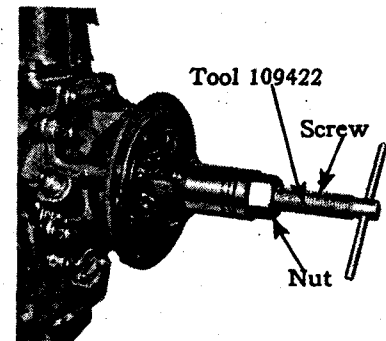


Fig. 5
Universal joint pusher.
Use adapter on end of screw for Cadillac 341-A and B; LaSalle 303, second type, and 328

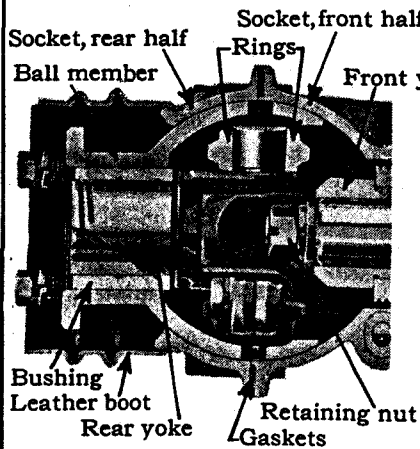


Fig. 6
Sectional view of universal joint.
LaSalle 303, first type

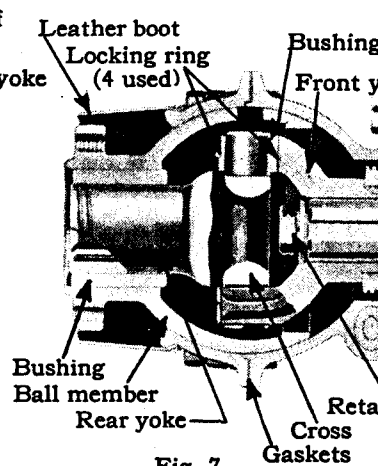


Fig. 7
Sectional view of universal joint.
Cadillac 341-A and LaSalle 303, second type

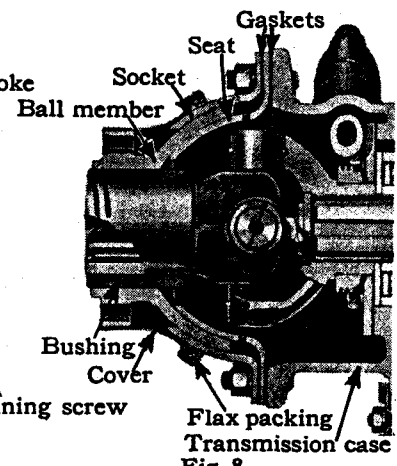


Fig. 8
Sectional view of universal joint.
Cadillac 341-B and LaSalle 328

Wheels, Rims and Tires

Subject	Cadillac 341		LaSalle 303-328		Specifications	Remarks
WHEELS AND RIMS						
Adjustment of bearings.....	A	B	303	328	See note 1.
Brake drums, out of round....	A	...	303	....	Not over .015 in. (Indicator reading).
	...	B	....	328	Not over .007 in. (Indicator reading).
Wheel felloe, out of true.	A	B	303	328	Not over $\frac{1}{16}$ in. (Indicator reading).	
(Radial and lateral run-out)						
Wheel size.....	A	B	303	20 in.	With some makes of chains it is necessary to use 33x6.20 chains on 32x6.75 tires to prevent interference with brakes.
				328	19 in.	
Rim size.....	A	B	....	....	20 x 6 in.
			303	....	20 x 4 $\frac{1}{2}$ in.
				328	19 x 5 in.	
TIRES						
Balancing mark, location of...	A	B	303	328	In line with valve stem	
Chain size.....	A	...	....	....	.....
Recommended pressure—						
Front.....	A	B	303	328	40 lbs., normal 50 lbs., high speed	
Rear.....	A	B	303	328	40 lbs.	
Size.....	A	B	....	....	Old marking New marking
	...	...	303	....	32 x 6.75 7.00/20
					32 x 6.00 6.00/20	
					32 x 6.20 6.50/20	
				328	31 x 6.20 6.50/19	

1. Bearing Adjustments

The roller bearings in the front and rear wheels of 341-A and 341-B cars and the ball bearings in the front wheels of 303 and 328 La Salle cars should not be adjusted too tight. They should be adjusted so that a very slight amount of play or looseness may be discerned. If, after a bearing has been adjusted to a point that is apparently correct the locking device cannot be placed in position without changing the adjustment loosen instead of tightening the adjusting nut until it can be secured with the locking device.

CAUTION: When adjusting the front wheel bearings care should be taken not to mistake play in the knuckle bolt for play in the wheel bearings. To eliminate dragging of the brakes as a factor in this adjustment it is also a good plan to turn the wheels to the right when adjusting the left-hand wheel bearings, and turn the wheels to the left when adjusting the right-hand wheel bearing. This automatically insures full release of the brakes.

The rear wheel bearings on 303 and 328 cars are not adjustable.

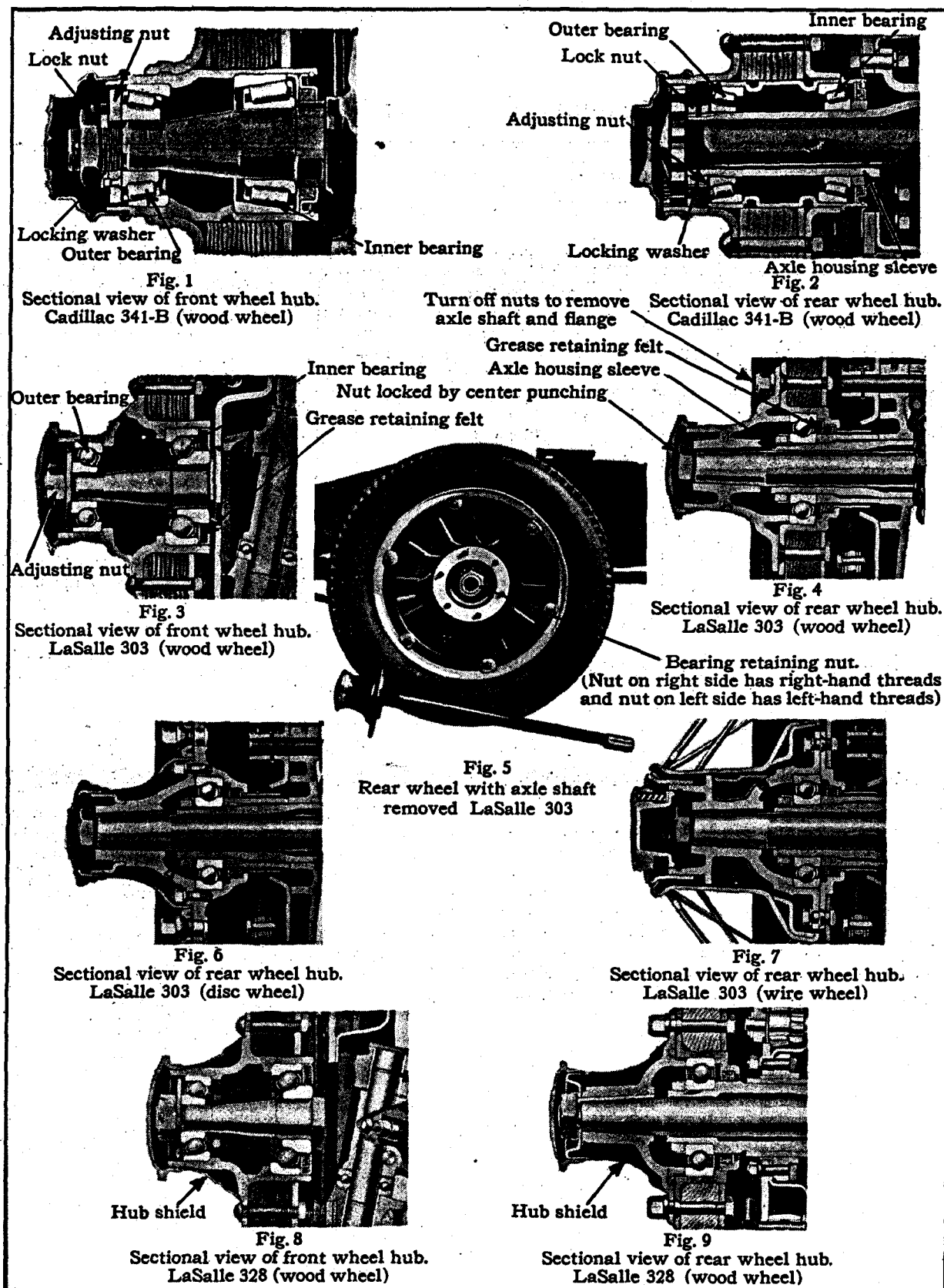


Plate 61. Cadillac and La Salle wheel bearings.