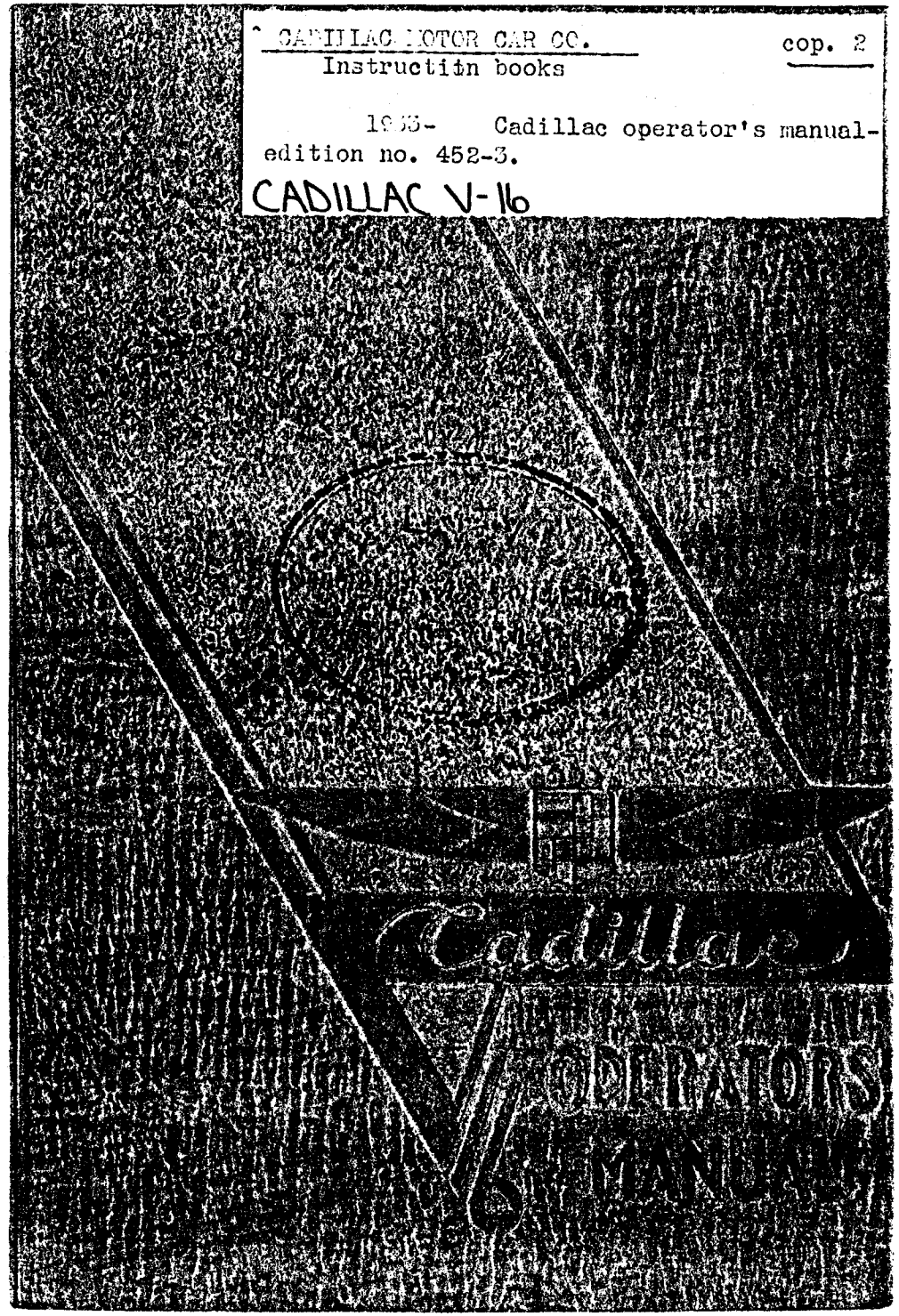
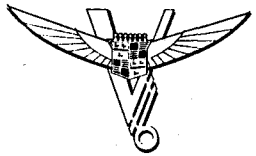


CADILLAC
OPERATOR'S MANUAL



1933

EDITION NO. 452-3

In ordering a duplicate of this Manual specify the above number or the engine number of the car.

Table of Contents

CHAPTER I

CADILLAC SERVICE

THE OWNER of a Cadillac motor car has purchased a fine piece of machinery to serve him as a pleasant and dependable means of transportation. The Cadillac provides this means; pleasant because of its fine performance, comfort and ease of control; dependable because of the care with which it was built and because of Cadillac Service, which operates on a standard policy, guaranteeing the owner efficient service everywhere at standard prices under factory regulation.

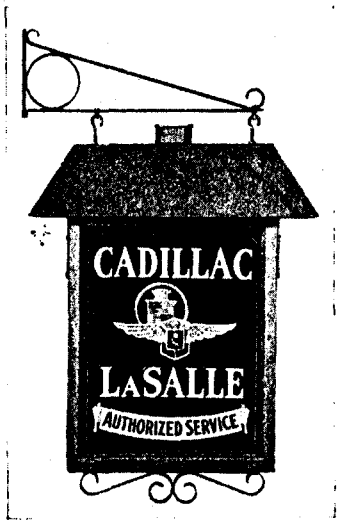


Fig. 1. Authorized Cadillac-La Salle Service Stations display this sign at the service entrance.

Cadillac - La Salle Service Stations

Cadillac Service is available 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 shown on this page. 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 naturally will 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 him satisfaction. Cadillac Service is so organized, however, that the owner may feel perfectly free to use his car for extended travel, secure in the knowledge that other Authorized Cadillac-La Salle Service Stations are able and willing to offer the same service benefits to which he is entitled at his local service station.

Identification 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 an Identification Card. This card is mailed to the owner by the Cadillac Motor Car Company as soon as 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 on the car. This holder is located under the cowl in the driving compartment on the right-hand side of the car as shown in figure 3.

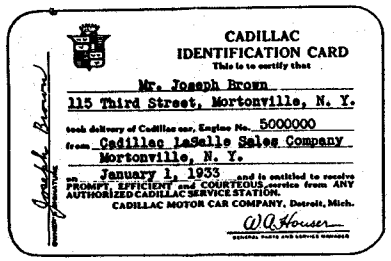

CADILLAC
IDENTIFICATION CARD
This is to certify that
Mr. Joseph Brown
115 Third Street, Mortonville, N. Y.
took delivery of Cadillac car, Engine No. 5000000
from Cadillac LaSalle Sales Company
Mortonville, N. Y.
on January 1, 1933 and is entitled to receive
PROMPT, EFFICIENT and COURTEOUS service from ANY
AUTHORIZED CADILLAC SERVICE STATION.
CADILLAC MOTOR CAR COMPANY, Detroit, Mich.
W. A. Houser
Joseph Brown

Fig. 2. The Identification Card, when properly signed, introduces the owner at any Authorized Cadillac-La Salle Service Station.

Upon presentation of this Identification Card at any Authorized Cadillac-La Salle Service Station, the car owner is assured of standard Cadillac Service under factory regulation.

Care of the Car

A fine piece of machinery, such a Cadillac, naturally requires a certain amount of care to ooth running, dependability and long life, and the ou e utmost in

continuous satisfaction and utility from operation of the car by following the instructions given below:

1. Drive the car at moderate speeds for the first 500 miles.

2. Operate the car in accordance with the instructions contained in this manual.

3. Check the engine oil level every 100 to 150 miles and add oil as often as necessary to keep the indicator at "Full."

4. Check the air pressure of the tires at least once a week and keep it up to the recommended pressure—40 pounds front and rear; on cars driven at high speeds, 45 pounds in front.

5. Add distilled water to the storage battery every 1000 miles, and in warm weather every 500 miles, or at least every two weeks.

6. Have the car lubricated every 1000 miles, or once a month in accordance with the lubrication schedule given on page 10.

7. Have the car inspected by an Authorized Cadillac-La Salle Service Station every 1000 miles, or once a month.

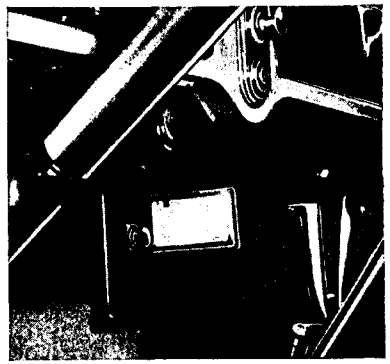


Fig. 3. The Identification Card should be kept in its holder under the cowl at all times.

Authorized Service

The first five items above do not necessarily warrant a visit to the service station. The last two, however, require the attention of those whose knowledge and experience qualifies them to perform the required work efficiently and in accordance with factory recommendations.

A car such as t -16, built with skill, precision and

fine workmanship, is deserving of the finest care of qualified experts in any service work that may be required. Authorized Cadillac-La Salle Service Stations are qualified to do this work in a manner not to be duplicated elsewhere because they have greater reason to be interested in the operation of the Cadillac owner's car. Their personnel are specialists; they have had more experience on Cadillac and La Salle cars than anyone could have who works on all makes of cars. They have up-to-date, expert information on Cadillac adjustments and service methods supplied by the factory in regular publications and special bulletins.

Preventive Service

Preventive service is the fundamental principle of Cadillac Service. It is based on the knowledge that regular expert attention keeps emergency service at a minimum, assuring continuous satisfactory operation of the car with a minimum of interruption and expense.

The first thought, of course, is the proper protection of all working parts through correct lubrication according to schedule. The second, of great importance, is systematic inspection every 1000 miles, or once a month, so that any necessary adjustments may be made before the need becomes an emergency.

Authorized Cadillac-La Salle Service Stations will make such inspections without charge. Lubrication and any necessary adjustments will then be performed at standard prices under factory regulation after the owner has approved the work and the prices.

Repair Parts

Genuine Cadillac parts, manufactured to the same rigid specifications as the parts originally used in the car, are 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 Cadillac distributor's or dealer's service station.

Service Charges

Authorized Cadillac-La Salle Service Stations, in line with the Cadillac policy of serving the owner to his best advantage, are prepared to offer service in three ways:

1. Individual operations on a flat-rate basis, authorized by the owner as occasion requires.

2. A Standard Service Contract covering complete mechanical maintenance—lubrication, inspection, all adjustments and repairs—over a period of one year or 12,000 miles at a fixed price.

3. A Lubrication Agreement covering 12 scheduled lubrications and 12 thorough inspections over a period of 12,000 miles at a fixed price. Under this plan any adjustments or repairs the owner authorizes are paid for as individual operations.

The owner may obtain service in any of these three ways he chooses. Certain advantages are to be derived from the Standard Service Contract of the Lubrication Agreement, but the owner may purchase service in any of these forms with perfect assurance that the work will be done in accordance with Cadillac standards.

Flat Rate Service

When a car enters the service station, it is promptly inspected by an expert tester who quotes the owner an exact price, which in practically every case includes material as well as labor, for the work he finds necessary. The owner then authorizes the work at this price and when he receives the bill, this is the price he pays.

Charges prevailing at Authorized 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, thus assuring the highest quality of work at the lowest possible price. Standard price schedules are open to owners for inspection at any Authorized Cadillac-La Salle Service Station.

Standard Service Contract

The Standard Cadillac Service Contract is available to owners who wish to be assured of continuous satisfactory operation and maintenance of their cars at a predetermined, economical cost. It is based on Cadillac's principle of preventive service insuring the greatest satisfaction with the fewest possible interruptions. Complete lubrication on schedule and thorough inspection to anticipate the need of adjustment and repair largely eliminates the need of service between regular inspections.

The Service Contract is recognized by all Authorized Cadillac-La Salle Service Stations in the United States regardless of where it may have been purchased. The owner is thus assured of all Contract service due him without additional charge wherever he may travel. He need only present the identification card issued to him at the time the Contract is purchased to receive this service the same as if the work was performed by the service station from which the Contract was purchased.

These contracts are available at all Authorized Service Stations. Two contracts are available to cover each of two periods; the first year or first 12,000 miles, and the second year or second 12,000 miles, respectively. Owners are urged to take advantage of the conveniences offered by Contract ownership to obtain efficient and expert service under factory regulations for their cars at the predetermined economical cost.

Lubrication Agreement

Owners who do not purchase a Service Contract are urged to purchase a Lubrication Agreement. Lubrication according to schedule is the most important attention required by the car and the Lubrication Agreement assures this service regularly for 12,000 miles at a saving of more than 30% of the total cost of the twelve operations if paid for individually.

The Lubrication Agreement is recognized by all Authorized

Cadillac-La Salle Service Stations in the United States, the same as the Service Contract, and the identification card need only be presented to have the work scheduled performed at any Authorized Service Station, regardless of where the Agreement was purchased.

The holder of a Lubrication Agreement is relieved of the thought of lubrication cost during the entire 12,000 mile period by budgeting his expense beforehand. He need only take his car to the service station at monthly or 1000 mile intervals and request "schedule lubrication" to obtain all of the lubrication due, performed according to factory specifications.

Regardless of how the owner prefers to have the necessary service performed on his car, the surest guarantee of long life and complete motoring satisfaction at the least possible expense is correct lubrication and preventive service rendered every 1,000 miles or once a month by an Authorized Cadillac-La Salle Service Station.

LUBRICATION SCHEDULE

CADILLAC 452-C

OWNER'S NAME_____

ADDRESS_____

ENGINE NO._____ DATE DELIVERED_____

		LUBRICANT	LUBRICATION NO. AND MILEAGE AT WHICH DUE											
			1	2	3	4	5	6	7	8	9	10	11	12
			1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
LUBRICATION NOS. 1, 5, 7 AND 11	ADD LIQUID TO RADIATOR	WATER OR ANTI-FREEZE	O	O	O	O	O	O	O	O	O	O	O	O
	ADD ENGINE OIL AS NECESSARY	ENGINE OIL	O		O		O		O		O		O	
	STARTER, GENERATOR AND DISTRIBUTOR OIL CUPS	ENGINE OIL	O	O	O	O	O	O	O	O	O	O	O	O
	BRAKE AND RIDE REGULATOR PINS AND CONNECTIONS	ENGINE OIL	O	O	O	O	O	O	O	O	O	O	O	O
	ACCELERATOR AND CHOKE ROCKER SHAFT	ENGINE OIL	O	O	O	O	O	O	O	O	O	O	O	O
	DOOR HARDWARE	ENGINE OIL	O	O	O	O	O	O	O	O	O	O	O	O
	GREASE GUN CONNECTIONS	CHASSIS LUBRICANT	O	O	O	O	O	O	O	O	O	O	O	O
	WATER PUMP GREASE CUP	WATER PUMP LUBRICANT	O	O	O	O	O	O	O	O	O	O	O	O
	CLUTCH RELEASE FORK	WHEEL BEARING LUBRICANT	O	O	O	O	O	O	O	O	O	O	O	O
	*ADD WATER TO STORAGE BATTERY	DISTILLED WATER	O	O	O	O	O	O	O	O	O	O	O	O
	CHECK TIRE INFLATION		O	O	O	O	O	O	O	O	O	O	O	O
LUBRICATION NOS. 2, 4, 6 AND 10	DRAIN AND REPLACE ENGINE OIL	ENGINE OIL		O		O		O		O		O		O
	CLUTCH RELEASE BEARING	WHEEL BEARING LUBRICANT		O		O		O		O		O		O
LUBRICATION NOS. 3 AND 9	TRANSMISSION—ADD LUBRICANT	TRANSMISSION LUBRICANT			O			O			O			O
	REAR AXLE—ADD LUBRICANT	REAR AXLE LUBRICANT			O			O			O			O
	STEERING GEAR—ADD LUBRICANT	STEERING GEAR LUBRICANT			O			O			O			O
LUBRICATION NOS. 6 AND 12	BRAKE ASSISTER	ENGINE OIL						O						O
	SPRING COVERS	GEAR LUBRICANT						O						O
	WHEEL BEARINGS	WHEEL BEARING LUBRICANT						O						O
	SPEEDOMETER DRIVE SHAFT	CHASSIS LUBRICANT						O						O
	FAN	CHASSIS LUBRICANT						O						O
	DRAIN OIL FILTER							O						O
	**FLUSH COOLING SYSTEM							O						O
	**REFILL SHOCK ABSORBERS	SPECIAL OIL						O						O
	**CLEAN OIL PAN AND SCREEN		EVERY 12,000 MILES											O

*IN SUMMER INSPECT BATTERY EVERY 500 MILES OR AT LEAST EVERY 2 WEEKS.
**RECOMMENDED BUT NOT INCLUDED IN LUBRICATIONS 6 AND 12.
THE FOLLOWING OPERATIONS CANNOT BE PLACED ON A MILEAGE BASIS AND ARE NOT INCLUDED IN THE ABOVE SCHEDULE:
CHANGE REAR AXLE AND TRANSMISSION LUBRICANT—AS REQUIRED FOR LOW TEMPERATURES AT THE BEGINNING OF COLD WEATHER IN THE FALL AND AT THE BEGINNING OF MILD WEATHER IN SPRING.
CLEAN CARBURETOR AIR CLEANER AS NECESSARY BETWEEN 2000 AND 6000 MILES.

RECORD ON OTHER SIDE

Fig. 4. 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.

CHAPTER II

LUBRICATION

Lubrication Schedule

THE moving parts of the Cadillac V-16, built with infinite care and fitted to precision limits, deserve *effective* lubrication to preserve their smooth operating efficiency. Lubrication, to be most effective, must be done systematically at regular mileage intervals. To assist the owner in obtaining proper lubrication, a complete lubrication schedule is reproduced on page 10. This schedule, if faithfully followed, will insure correct lubrication of each wearing surface. As a further aid to the owner, an illustrated lubrication chart, based on the lubrication schedule, is furnished with this Manual to assist the operator in visualizing the location of the various lubricating points.

The unit of the chart as well as the schedule is 12,000 miles which is divided into twelve 1000-mile intervals. Corresponding to these is a series of lubricating operations, grouped and numbered consecutively from 1 to 12, intended to be performed successively at each 1000 mileage interval until the 12,000 mile cycle has been completed. At 13,000 miles, the schedule begins again with Lubrication No. 1 and continues through the series of twelve operations.

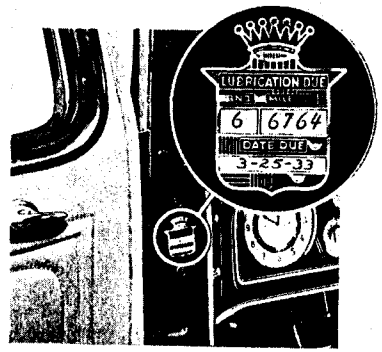


Fig. 5. The lubrication notice plate can be seen by opening the front left hand door a few inches.

Lubrication Notice

A metal plate in the shape of the Cadillac Crest is provided to serve as a lubrication notice and record. This plate is mounted on the left front door pillar just below the top hinge as shown in figure 5.

Authorized Cadillac-La Salle Service Stations, after performing each schedule operation, post on this plate the number of the next operation and the mileage at which it will be due. Thus, when the mileage recorded on the speedometer is the same as the mileage marked on the notice, the car may be taken to any Authorized Cadillac-La Salle Service Station, and, without further ordering other than specifying "schedule lubrication," the car will receive the exact lubrication necessary.

Although the schedule is expressed in terms of miles the car should be lubricated once each month even though the mileage indicated on the speedometer is less than 1000 since the last lubrication operation was performed. The lubrication work can be done while the car is in the service station for its regular monthly or 1000 mile inspection.

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 purpose for which they are to be used.

Cadillac engineers have worked out in detail the specifications for the lubricant required for each point to meet the particular conditions of speed, load, temperature and kind of metals in contact.

Authorized Cadillac-La Salle Service Stations are prepared to furnish lubricants under these specifications to give the best results in their respective localities. When the car is lubricated by someone not familiar with Cadillac specifications, lubricants should be called for by the S. A. E. viscosities recommended in the following paragraphs.

Engine Oil

Engine oil recommendations are given in the chart below. It should be noted that different grades of oil are to be used for average driving and for prolonged high speed driving in both summer and winter.

<table>
<tr><td rowspan="2">TYPE OF SERVICE</td><td>SUMMER</td><td colspan="2">WINTER</td></tr>
<tr><td>All Temperatures Above 32° F.</td><td>Between 32° and 15° Above</td><td>Below 15° Above Zero</td></tr>
<tr><td rowspan="2">AVERAGE DRIVING (No prolonged high speed driving)</td><td rowspan="2">S. A. E. visc. 40 or 50</td><td>S. A. E. visc. 20</td><td>S. A. E. visc. 10</td></tr>
<tr><td colspan="2">These oils are not suitable for prolonged high speed driving and if used under such conditions the oil level must be closely watched, as the rate of consumption will be higher than with heavier oils.</td></tr>
<tr><td>PROLONGED HIGH SPEED DRIVING</td><td colspan="3">CADILLAC APPROVED "HEAVY DUTY" OILS—SUMMER AND WINTER
These oils have an S. A. E. viscosity of 40-50-60, and are required to meet certain specifications as to volatility in order to demonstrate their fitness for prolonged high speed driving. To make certain of using an oil approved for this service, consult your Cadillac distributor or dealer.
NOTE: Approved heavy duty oils vary in their suitability for winter use. If an approved heavy duty oil with sufficiently low cold viscosity is not available and if the car is not kept in a heated garage, the lighter oils specified above for average driving must be used to avoid hard starting. In this case, be sure to watch the oil level closely as cautioned above.</td></tr>
</table>

*The system used in this table to designate body or viscosity is the one developed by the Society of Automotive Engineers and adopted by all oil companies. It takes the place of the old indefinite method of describing oils as "Light," "Medium," "Heavy," etc. Oil should be called for by these numbers. If a filling station attendant does not know the S. A. E. numbers of his oils, the following grades can be substituted in emergency: S. A. E. 10, Extra Light; S. A. E. 20, Light; S. A. E. 40, Heavy; S. A. E. 50-60, Extra Heavy.

Transmission Lubricant

Gear oil of S. A. E. Viscosity 160 should be used in the transmission at temperatures above 20° F. For temperatures below 20° F, a light oil of S. A. E. viscosity 90 should be used or the oil used during summer weather should be thinned with kerosine.

Some of the lubricants designated by "EP" following their S. A. E. classification, and some other lubricants which are being marketed, are injurious to bronze parts and should not be used in Cadillac cars under any circumstances. Likewise, soap greases will not satisfactorily lubricate these gears and should not be used.

Rear Axle Lubricant

Gear lubricant of S. A. E. Viscosity 160 should be used in the rear axle. For extremely low temperatures, it may be necessary to change to a light lubricant of S. A. E. viscosity 90 or to thin the lubricant with kerosine as suggested under "Transmission Lubricants."

Steering Gear Lubricant

The selection of the proper lubricant for the steering gear is of special importance, particularly to avoid hard steering in cold weather. A special steering gear lubricant suitable for extreme heat and cold is available and should be used in the steering gear the year round.

Chassis Lubricant

A good grade of chassis lubricant should be used for all chassis points indicated in the lubrication chart as requiring this type of lubricant. Ordinary cup grease is not satisfactory and if, in an emergency, it is used in place of chassis lubricant, the car should again be lubricated within 300 or 400 miles.

Clutch and Wheel Bearing Lubricant

The front wheel bearings and the clutch release bearing should be lubricated with a good grade of Clutch and Wheel Bearing Lubricant having a high melting point. Ordinary grease at these points is likely to melt and run on to the brakes or the clutch.

Water Pump Lubricant

A water-resistant calcium soap lubricant having a high melting point is recommended for use in the water pump grease cup. Only lubricants of this type should be used; other lubricants will be dissolved into the cooling system liquid. Cup greases and wheel bearing lubricants are entirely unsuited for this purpose.

Engine Lubrication

The supply of engine oil is carried in an oil pan at the bottom of the crankcase and is circulated through the engine by means

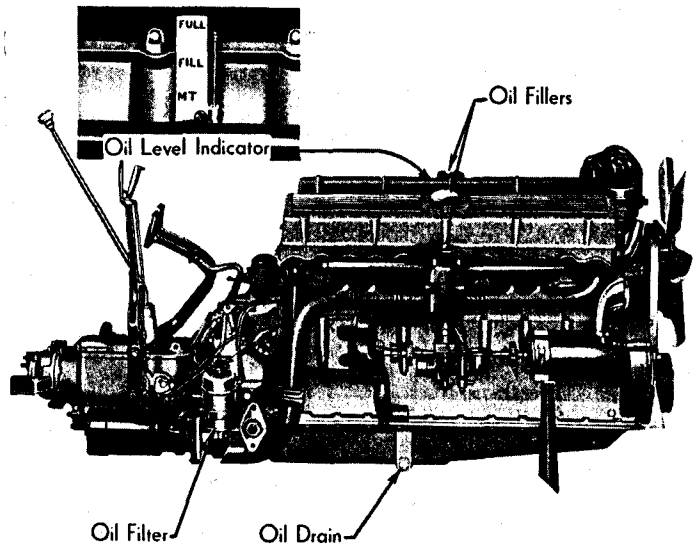


Fig. 6. The external features of the engine lubricating system.

of a gear pump inside of the crankcase. The oil circulated by this pump lubricates the main and connecting rod bearings, the camshaft bearings, the cylinder walls, the pistons and the piston pins, the front end chains and the valve mechanism.

There are a few points on the engine that cannot be taken care of by the pressure system and these points should be lubricated according to the instructions given in the lubrication chart. This includes the starting motor, the generator, the distributor, the water pump and the fan.

Oil Level

The normal capacity of the oil pan is ten quarts which fills it to the level of the screen in the pan. When the oil pan contains this amount the oil level indicator on the left-hand side of the engine (figure 6) shows "Full." The oil level should be checked every 100 to 150 miles and, whenever necessary, enough oil should be added to bring the indicator up to "Full." It should never be permitted to drop below "Fill."

Particular attention should be paid to the oil level in case of prolonged driving at high speed. At high speeds the oil is consumed many times more rapidly than at city driving speeds and oil must be added more frequently to maintain the proper level.

Crankcase Ventilating System and Oil Filter

Cadillac V-16 engines are equipped with a crankcase ventilating system and an oil filter to keep the oil in the best condition possible. The ventilating system, which functions automatically, prevents dilution and contamination of the oil by removing the vapors which seep past the pistons.

The oil filter removes dirt and solid matter from the oil and is connected to the line which supplies oil to the valves. It requires no attention other than draining every 6000 miles, as described on page 57, to remove the accumulated foreign matter. The oil pan and screen should be removed and thoroughly washed with

gasoline every 12,000 miles to remove any carbon or foreign particles that may have collected.

Changing Engine Oil

The useful life of the engine oil is greatly prolonged by the use of the crankcase ventilating system and the oil filter, but the oil pan should be drained and the engine oil replaced every 2000 miles. To drain the oil, simply remove the drain plug (figure 6) and allow the oil to flow into a receptacle placed under the car. The drain plug should then be reinstalled and tightened securely before pouring in fresh oil. Ten quarts are required to bring the oil level indicator to "Full."

CHAPTER III

OPERATION

One of the first things the driver of the Cadillac V-16 should do is to familiarize himself with the location and use of the instruments and controls described in this chapter.

Gasoline Gauge

The gauge marked "Gasoline" indicates in gallons the quantity of fuel in the tank at the rear of the car. This gauge operates electrically and indicates the quantity of fuel *only when the ignition is turned on*. When the tank is being filled and the driver wishes to check the amount of fuel in the tank, he should first shut off the engine to comply with filling station regulations and then switch on the ignition so that the gauge will operate.

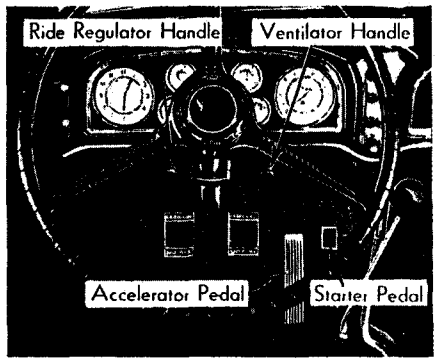


Fig. 7. General arrangement of the driving controls.

Oil Pressure Gauge

The oil pressure gauge indicates only the pressure under which the oil is being forced to the engine bearings. It *does not* indicate the *quantity* of oil in the engine. The gauge should indicate zero as long as the engine is not running, but as soon as it is started and as long as it runs, it should show pressure. If no pressure is indicated when the engine is running, the engine should be stopped at once. Serious damage may result if the engine is run for any length of time whatever with no oil pressure.

Ammeter

The gauge marked "Amperes" indicates the rate of charge or discharge of the battery. It does not indicate the total output of the generator at any time nor does it indicate the current drawn by the starting motor when starting the car.

The ammeter should indicate on the charge side most of the time; otherwise more current will be drawn from the battery than is put into it and the battery will eventually become fully discharged. Normally, when no lights are in use, the ammeter

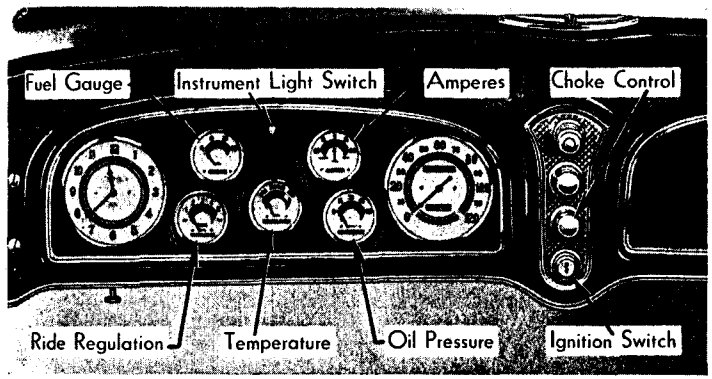


Fig. 8. Arrangement of the instrument panel.

should show "charge" as soon as the car is running ten or twelve miles an hour in high gear. If it fails to show a charge under these conditions, or if it shows a discharge when the engine is not running and no electrical equipment is in use, the cause should be investigated.

Temperature Indicator

The temperature of the cooling liquid in the radiator is indicated by the gauge marked "Temperature." For ordinary driving, after the engine has warmed up, the indicator should

stay within the "Normal" range, but under conditions of long hard driving, especially in summer weather, it may indicate "Hot." This is to be expected and will not interfere with efficient operation of the engine. If it indicates "Hot" after short runs and under average operating conditions, however, the cause should be investigated. The temperature indicator will always show a temporary rise in temperature immediately after stopping the engine. This likewise is a natural condition and is due to the residual heat in the engine.

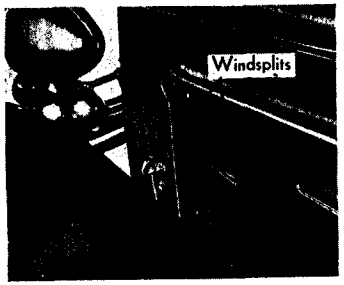


Fig. 9. The hood ports may be opened by pulling out on the windsplits.

For average operation in warm weather, the hood ports should be open. Ordinarily, these ports should be opened at the start of warm weather in the spring and left open until the beginning of cold weather in the fall. They may be opened by simply pulling out on the windsplits on the hood ports.

Throttle Control

The throttles of the two carburetors are operated simultaneously and may be controlled either by the hand lever on the steering wheel or by the accelerator pedal on the toe board. The normal positions of the hand control is all the way up to "CLOSED." In this position the throttles of the carburetors are open just enough to permit the engine to run at idling speed after it has warmed up.

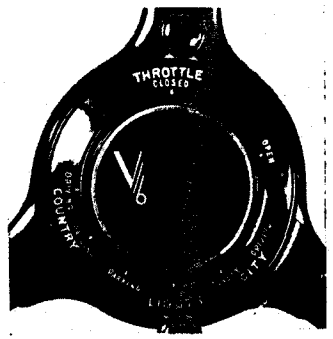


Fig. 10. The throttle hand control is the top lever on the hub of the steering wheel.

The hand throttle should be opened only when it is desired to run the engine at a speed slightly faster than idling such as when warming up the engine. For starting, the hand throttle should always be in the fully closed position to insure a sufficient proportion of gasoline to air getting to the cylinders. The correct throttle opening for starting is automatically set when the choke control is operated. Opening the hand throttle increases the proportion of air rather than gasoline and may make starting difficult rather than easy. It is particularly important to have the throttle entirely closed in cold weather starting (see Chapter IV, page 39).

Choke Control

To increase the proportion of gasoline to air reaching the cylinders in starting the engine the choke button should be pulled out. This button is located on the center section of the instrument panel just above the ignition switch lock.

If the engine is warm from previous running, the choke button need not be pulled out, but for the quick starting of a cold engine, the choke should always be used.

As soon as the engine starts, it is important to push the choke button in part way, and as soon as the engine is warm enough to idle on a normal mixture, the button should be pushed all the way in. An excess of gasoline reaching the cylinders will wash off the oil on the pistons and cylinder walls, interfering with the proper lubrication of these surfaces. The button should never be left out any longer than necessary to insure proper running without "popping back."

The choke 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, it must be pulled out and kept partly out during the cranking operation.

Starting the Car

To start the car, first make sure the transmission is in neutral and the hand throttle is in the fully closed position. Then pull out the choke (unless the car is warm from previous running), switch on the ignition by turning the key to the left until the lock cylinder springs out, and step on the starter.

As soon as the engine starts, release the starter pedal and push the choke button in as far as possible without stalling the engine. When the engine warms up, ***push the choke button all the way in.*** The proper use of the choke control will permit the engine to run smoothly until it warms up. The engine should never be raced to warm it up. Racing the engine is not only unnecessary, but ineffective.

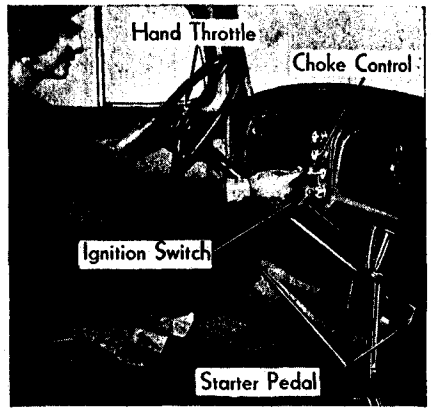


Fig. 11. The position of the hand throttle and the proper use of the choke control are of particular importance in starting the car.

Starting Hints

In cold weather, disengage the clutch to get a quicker start and to relieve the battery of the strain of turning the transmission gears.

If the engine does not start readily, release the starter pedal and look for the cause.

Do not run down the battery by too much use of the starter motor when the engine does not start readily. First find the cause; otherwise, the battery may be run down sufficiently to make starting impossible.

Check the contents of the gasoline tank.

See that the throttle hand lever is in the closed position and that the choke control has been used properly.

If the carburetors are choked from unnecessary use of the choke control or unnecessary priming with the accelerator pedal (see page 39), turn off the ignition, move the hand throttle to the fully open position and hold the starter pedal down for 10 to 15 seconds to get rid of the surplus gasoline. Next, return the hand throttle to the closed position, turn on the ignition and step on the starter.

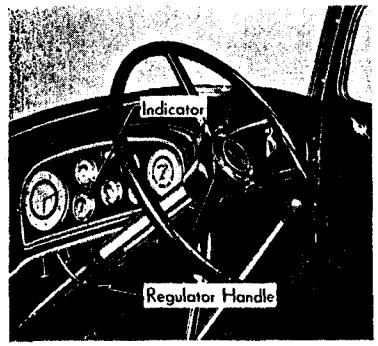


Fig. 12. The degree of ride regulation can be controlled by the handle on the left hand side of the steering column.

Ride Regulation

The driver may control the action of the shock absorbers at any time to suit the conditions of road and speed. The control handle is located beneath the instrument panel on the left-hand side of the steering column.

The degree of control is indicated by a dial on the instrument panel labeled "Ride Regulation," and marked with five degrees, ranging from "free" to "firm." In general, "free" is for slow speeds over city pavements, while "firm" is for fast speeds over rough roads, but the driver can best determine by trial the degree of firmness or softness best suited to his requirements under conditions of car load, speed and the road.

SUPERSAFE HEADLIGHTING

Equipment

SUPERSAFE headlamps on Cadillac V-16 cars represent the latest development in motor vehicle lighting. Through two

added positions on the steering column switch, as shown in Fig. 13, two pairs of beams are placed under the immediate control of the driver. Upper and lower "city" beams, for ordinary use under the more favorable conditions of operation, occupy the two conventional switch positions on the right. Upper and lower "country" beams, for emergency use, occupy two added switch positions on the left.

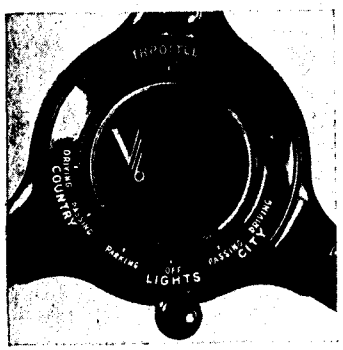


Fig. 13. SUPERSAFE Lighting Switch.

The SUPERSAFE lens is shown in Fig. 14. The name is plainly embossed on the lens face. The lens is covered with vertical cylindrical flutes arranged in three horizontal zones. These flutes serve to distribute the light sideways to best advantage. The optical characteristics of the two lenses are different. They are marked RIGHT and LEFT at the top and are not interchangeable. The SUPERSAFE reflector is shown in Fig. 16. The name is stamped on the rim. The reflector area is divided into four horizontal zones to distribute the light properly ahead of the car. The reflectors are not interchangeable. Lenses, doors and reflectors are arranged so that they cannot be installed in the wrong lamp.

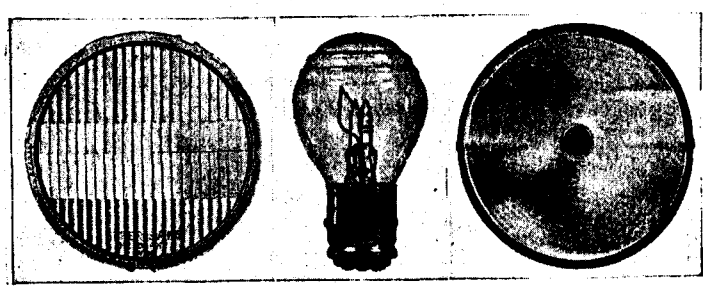


Fig. 14. SUPERSAFE Lens.

Fig. 15. Bulb No. 3001.

Fig. 16. SUPERSAFE Reflector.

The SUPERSAFE bulb, Mazda No. 3001, is shown in Fig. 15. In addition to the two conventional 21 cp. V-shaped filaments corresponding to the filaments in the standard two-filament bulb, there is a third 32-cp. I-shaped filament as shown. The same bulb is adapted for both headlamps but operates with the 32 cp. filament below in the right and above in the left headlamp. Bases and sockets are arranged to prevent improper installation. Accurate bulbs are extremely important. Replace only with bulbs of reputable manufacture.

Satisfactory SUPERSAFE performance involves the use of the particular lenses, reflectors and bulbs for which the lamps are designed. Replacement parts are stocked by Cadillac dealers.

Operation

Basic headlighting requirements and limitations are relatively simple. To protect the driver behind the lights the illumination must be sufficient to reveal objects on and above the road at a safe distance in advance of the car. To protect oncoming drivers from dangerous glare the intensity directed into the eyes of others must be relatively low. To satisfy these requirements and limitations in practice is quite another matter. Objects which the driver must see to drive safely are only slightly below the eyes of

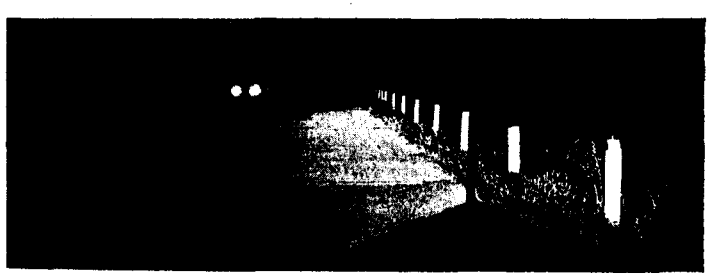


Fig. 17. SUPERSAFE CITY UPPER BEAM aimed low enough to avoid glare on level roads.

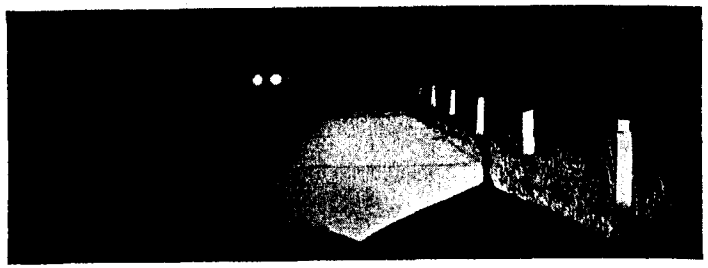


Fig. 18. SUPERSAFE CITY LOWER BEAM with more light and greater range on right side of road to facilitate passing.

an oncoming driver. The intensity required to reveal objects several hundred feet ahead is several times higher than that which an approaching driver can face safely. Relatively extreme variations in road contour and rear seat loading make it impossible to control the level of the beam in such manner as to keep it just below the other driver's eyes at all times.

Two headlighting practices are in general use throughout the country. The fixed-beam practice is based on a compromise between road illumination and glare which is intended to relieve the driver of all responsibility for dimming or depressing his beams to avoid glare. It specifies that the headlamp beams on all cars shall be aimed to cut the light off sharply at and above

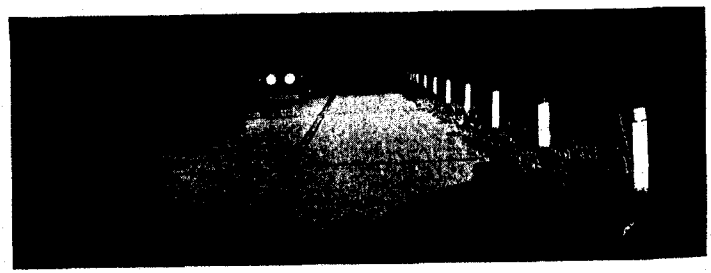


Fig. 19. Conventional Upper Beam aimed low enough to avoid glare on level roads.

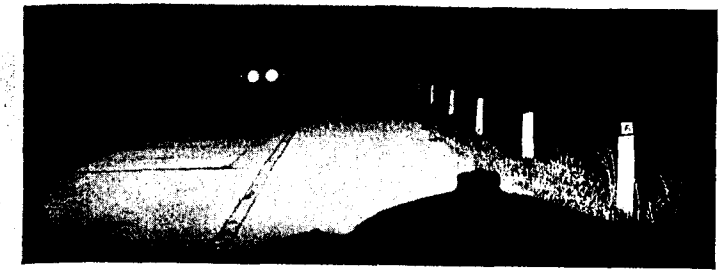


Fig. 20. Conventional Lower Beam obtained when upper beam is aimed low enough to avoid glare on level roads.

the headlamp level when the car is fully loaded. This adjustment serves nicely under the more favorable conditions of driving. The dual-beam practice permits the driver to aim his beam to suit his individual requirements and makes him directly responsible for dimming or depressing when necessary to avoid glare. This practice favors the more difficult conditions of driving.

The SUPERSAFE system of headlighting is a combination of fixed-beam and dual-beam systems. It retains all of the advantages in both and avoids some of the inherent disadvantages in each when used separately.

The city upper and lower beams, shown in Figs. 17 and 18, correspond closely with the conventional upper and lower beams from dual-beam headlamps, shown in Figs. 19 and 20, when both are aimed in accordance with fixed-beam practice. The upper beams differ primarily in that the conventional beam distributes the light equally on both sides whereas the SUPERSAFE beam directs more light to the right side of the road thereby favoring the more difficult condition experienced in approaching another vehicle. The lower beams differ primarily in that the conventional beam is tilted uniformly all the way across the road whereas the SUPERSAFE beam is tilted by the conventional amount on the left in the path of the oncoming car but by only half that amount on the right where the added range is most valuable in passing. Also, the conventional beam distributes the light equally to both sides whereas the SUPERSAFE beam directs

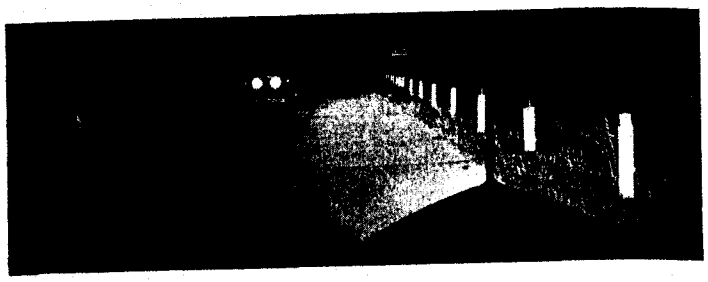


Fig. 21. SUPERSAFE COUNTRY UPPER BEAM with added light above headlamp level to provide safe illumination on rolling and winding roads.

substantially more light to the right where it is most needed to cut through the glare from oncoming headlamps.

The city beams serve to good advantage under the relatively favorable conditions which constitute a large percentage of the average driver's operation at night. On the strictly level roads encountered in some parts of the country, the city upper beam avoids glare at all times and provides adequate road illumination for normal speeds. Adequate road illumination for reasonably high speed is provided when the rear seat is fully loaded to depress the rear end of the car and raise the beams to their maximum upper limit. On moderately rolling roads under the more favorable conditions of lighted city streets and highways, medium to heavy traffic on dark country roads where other headlamps help to light the way, and even in relatively light traffic on dark roads

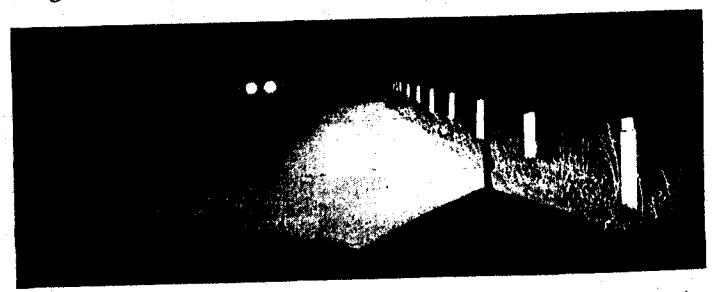


Fig. 22. SUPERSAFE COUNTRY LOWER BEAM with added light and no tilt on right side of road to facilitate passing.

at very moderate speed, the upper beam avoids glare and provides adequate road illumination even when the rear seat is empty. On hilly roads the lower beam only is available for continuous use as a means for avoiding glare.

The SUPERSAFE country upper and lower beams, shown in Figs. 21 and 22, are readily at hand for emergency use in supplying adequate road illumintation with minimum glare under the more difficult conditions of operation. They correspond in principle to the upper and lower beams from conventional headlamps aimed high enough to accomplish a similar result. The conventional upper beam, so aimed, is shown in Fig. 23.

The SUPERSAFE country upper beam is developed around the city upper beam, aimed in accordance with fixed-beam practice,

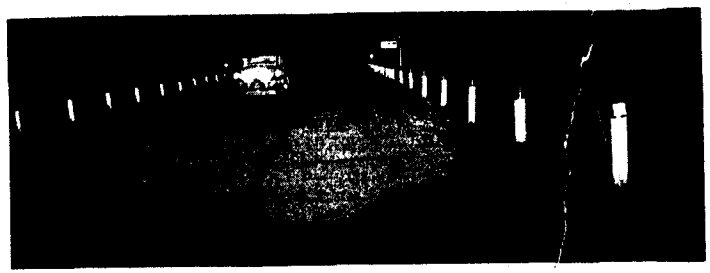


Fig. 23. Conventional Upper Beam aimed high enough to provide safe road lighting on rolling and winding roads.

as a base, by superimposing on that beam the light from an added filament in the right headlamp arranged to intensify the illumination in the area ordinarily covered by the city beam and add light above the headlamp level but only as much as is really necessary for safety. This stray light projects well above the headlamp level, sufficient to show the way up hills as well as to light up objects whose more substantial or lighter colored parts are several feet above the road surface and to reveal curves and turns at a safe distance by lighting up the background beyond them regardless of rear seat loading. The conventional upper beam must be

aimed high to accomplish somewhat the same result. Its performance is seriously handicapped by the need for arranging the upper beam to accommodate the fixed-beam practice in some states and thereby permit the sale of the same lamp design in all parts of the country. The maximum height to which the upper level of the beam may be aimed to show the way up hills is very much limited by the sharp cut-off with maximum intensity just below it as dictated by fixed-beam considerations. Furthermore, the intensity necessarily directed above the headlamp level through these design limitations is several times more than is really needed for the purpose and thereby adds a needless potential glare hazard.

The SUPERSAFE country lower beam is developed around the city lower beam by superimposing on that beam the light from an added filament in the left headlamp arranged to add substantially to the amount of light on the right side of the road and to raise its upper level on that side to the same level as that of the city upper beam. By increasing the intensity and range of visibility ahead of the car in this manner no road illumination penalty is involved in changing to the lower beam to protect an oncoming driver from glare. By making the lower beam better and safer than the upper beam for passing the use of the proper beam at the proper time is encouraged. Another advantage in the added range is that it substantially extends the utility of the lower beam in traveling over dark roads when traffic is light, thereby minimizing the nuisance in repeatedly changing from upper to lower beam.

Legal Restrictions

All of the advantages in the SUPERSAFE system are available to Cadillac owners in thirty-two of the forty-eight states. States in which the added light has been or may be declared illegal and in which cars are delivered with the country upper beam modified to eliminate this feature are as follows:

California	Connecticut	Iowa	Maine
Maryland	Massachusetts	Minnesota	New Hampshire
New Jersey	New York	Oregon	Pennsylvania
Rhode Island	Vermont	Virginia	Washington

Unmodified SUPERSAFE headlamps will add substantially to your own safety and comfort in driving at night. They will add substantially to the safety and comfort of those you meet on the highway—if properly used.

USE THE COUNTRY UPPER BEAM ONLY WHEN NECESSARY. NEVER USE IT WHEN WITHIN THREE HUNDRED FEET OF AN ONCOMING DRIVER. NEVER USE IT WITHIN THE BOUNDARIES OF THE STATES LISTED ABOVE.

SUPERSAFE headlamps must be kept in proper adjustment to insure satisfactory performance in service. Instructions for adjustments are given on page 64, Chapter VI.

Driving Hints

The driver owes it to other users of the streets and highways as well as himself to drive in such a way that the car is always under his complete control. The driving equipment on the Cadillac V-16—the brakes, the ride control, the lighting equipment and the synchro-mesh transmission—is designed to afford maximum safety at all times, but there are certain conditions requiring special care to make its use fully effective.

Speed

The Cadillac V-16 can be driven at speeds faster than the driver will ever require. The car operates so smoothly that the driver sometimes fails to appreciate the speed at which he is driving. He must, therefore, use judgment in driving to keep the car always in control. Blind curves, hills, rough roads, side roads and wind-

ing roads require a slower speed than smooth concrete straightaways where the driver may see clearly for considerable distance ahead. Where the vision ahead is limited, speed should be kept low enough so that the car can be stopped within a safe distance for any emergency.

Gravel Roads

Adjust the Ride Regulator control to whatever degree of firmness required to prevent excessive bouncing and side sway. Do not swerve quickly or hold to the outside edge of the road on a curve.

Hills

When approaching the top of a hill, be prepared for any cars coming up the other side.

The transmission should never be shifted to neutral for coasting down hill. If it is desired to coast, keep the transmission in gear and simply disengage the clutch. If the speed of the car becomes excessive while coasting down hill, engage the clutch and use the engine to assist the brakes. It must be remembered that the brakes are subjected to much more severe use on grades, where they must absorb the force of gravity as well as the momentum of the car, than on the level where they must absorb only the momentum of the car.

Ordinarily, the resistance offered by the engine with the transmission in high gear, supplemented by moderate use of the brakes, is sufficient to control the speed of the car. If excessive use of the brakes is still required, however, the transmission should be shifted to intermediate.

Slippery Roads

When stopping on slippery pavements, keep the car in gear and the clutch engaged until the car is nearly stopped. Apply the brakes gently. This will minimize the possibility of skidding. Do not attempt sudden stops.

Danger of Running the Car in Closed Garage

Always open the doors of the garage before starting the car.

Carbon monoxide, a deadly poison gas, is present in the exhaust of all internal combustion engines and for safety, this gas must be allowed to escape outside the garage. Under normal starting and warming up of the engine in a two car garage enough gas will accumulate in three or four minutes to overcome any occupants. When the choke is used excessively, such as for cold weather starting, the accumulation is more rapid.

Carbon monoxide is colorless, tasteless and almost odorless. *It gives no warning.*

Open the garage doors before starting the engine.

CHAPTER IV

COLD WEATHER OPERATION

SATISFACTORY operation of the car in freezing temperatures depends upon having the car prepared for cold weather and in giving it the special attentions which are required under such conditions. All the information relating to the care and operation of the car during cold weather has been grouped in this chapter to assist the operator in maintaining the fine performance of the car throughout the winter as well as the summer. This chapter should be reviewed just before the beginning of the winter season so that full benefit may be had of all the suggestions it contains.

Preparing for Cold Weather

Anti-Freezing Solutions

In selecting anti-freezing solutions for winter operation the local conditions and the type of service must be considered. The following information is given to enable the individual owner to more intelligently select the anti-freezing solution best suited to meet his own conditions.

The available commercial materials for preparing anti-freezing solutions for automobile radiators are denatured alcohol, methanol (synthetic wood alcohol), distilled glycerine, and ethylene glycol.

Denatured alcohol and methanol solutions are at present, the most generally used anti-freezing solutions. Denatured alcohol and methanol are widely distributed, afford protection against freezing, and are not injurious to the materials used in the cooling system.

There are two principal objections to denatured alcohol and methanol. These materials are lost by evaporation, especially on

heavy runs, and unless the solution in the radiator is tested periodically and sufficent anti-freeze added to replace the loss by evaporation, the motor or radiator, or both, are likely to be damaged by freezing. The car finish is damaged by contact with denatured alcohol or methanol solutions or vapors, and any material accidentally spilled on the finish should be flushed off immediately with a large quantity of water.

Methanol for anti-freeze purposes is sold in the United States in the correct concentration to give the same protection against freezing as denatured alcohol. The table below may be used for both denatured alcohol and methanol.

Lowest Temperature Expected	Per cent by Volume	Specific Gravity (at 60° F.)		Qts. Alcohol or Methanol required to make 7 gal. solution
		Denatured Alcohol	Methanol	
10 F.	30	.9668	.972	8½
0 F.	38	.9567	.964	10¾
—10 F.	45	.9475	.957	12¾
—20 F.	51	.9350	.950	14¼
—30 F.	57	.9260	.944	16

Important: The special oil used in the cooling system (see page 53) affects the hydrometer readings of the solution and allowances must be made for the difference. With the special oil in the cooling system, the actual freezing temperature of an alcohol or methanol solution is five degrees higher than indicated by the hydrometer. In other words, if the hydrometer reading indicates protection down to zero, the actual protection would be only down to five degrees above zero and similarly throughout the scale.

Distilled glycerine and ethylene glycol solutions are, in first cost, more expensive than alcohol but, as they are not lost by evaporation, only water need be added to replace evaporation losses. Any solution lost mechanically, however, either by leakage or foaming, must be replaced by additional new anti-freezing solution. These solutions, under ordinary conditions, are not harmful to the car finish.

The principal objections to glycerine and ethylene glycol are the tendency of these solutions to loosen rust and scale, which form in the water passages of the cylinder blocks and heads, and the difficulty of securing and maintaining tight, leakproof connections. It is absolutely necessary that the entire cooling system be thoroughly cleaned and flushed before glycerine or ethylene glycol is used.

It is also necessary to tighten or replace the cylinder head gaskets, hose connections and pump packing. The cylinder head gaskets must be kept tight to prevent the solution from leaking into the crankcase where it might cause gumming and sticking of the moving parts. The pump packing must be kept tight to prevent air from being drawn into the cooling system, in order to avoid foaming and other difficulties which may result when air is present.

Ethylene glycol (Prestone), sold in the United States for anti-freezing purposes, and radiator glycerine, produced under the formula approved by the Glycerine Producers' Association, are chemically treated to overcome the difficulties mentioned in the above paragraph, and, under normal operating conditions, with tight hose connections and cylinder head gaskets, should be satisfactory for use in the cooling system.

Glycerine and ethylene glycol should be used in accordance with the instructions and in the proportions recommended by the anti-freeze manufacturer. These solutions generally contain inhibitors acting in the same manner as the special oil used in Cadillac cooling systems and when these solutions are used, the proportion of the inhibitor should not be increased by the use of an additional inhibitor. Too large a percentage of the inhibitor will increase rather than retard foaming and result in more rapid formation of rust and scale as well as the loss of the anti-freeze solution by spillage.

In using a hydrometer to determine the temperature at which a solution will freeze, the test must be made at the temperature

at which the hydrometer is calibrated. If the solution is warmer or colder, it must be brought to this temperature or large errors may result. In some cases these errors may be as large as 30 degrees Fahrenheit. Freezing point hydrometers are not interchangeable. A different float is required for denatured alcohol, methanol, glycerine and ethylene glycol.

Salt solutions, such as calcium chloride, magnesium chloride or sodium silicate, kerosine, honey, glucose and sugar solutions are not satisfactory for use in automobile radiators.

Capacity of Cooling System

The capacity of the cooling system is 7 gallons when filled to a point about 1½ inches below the top of the filler neck. The radiator filler cap is located on the left hand side of the car under the hood (see Fig. 37, page 53). The cooling system on the Cadillac V-16 may be filled to a higher level since the overflow pipe is connected to a condenser tank which operates automatically to prevent excessive loss of the cooling liquid.

To insure proper operation of the condenser there should be no air leaks in the cooling system and the radiator cap should be secure. The condenser tank should be drained at the same time as the rest of the cooling system and a solution of anti-freeze should be added to protect it from damage by freezing.

Winter Lubrication

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

The chart of engine oil recommendations on page 13 gives the proper grade of engine oil to be used for cold weather driving. It will be noticed that lighter oils can be used during cold weather providing the car is not driven at high speeds. "Heavy duty" oils, however, must be used for prolonged high speed driving in

winter as well as summer to prevent excessive oil consumption.

The lubricant in the transmission and rear axle should be thinned or replaced with a lubricant of suitable cold viscosity as soon as the gears are hard to shift.

The lubricant used during winter weather in the steering gear should have a low cold viscosity and should preferably be an all year-round lubricant. Steering gear lubricants should not under any circumstances be thinned with kerosine as the pressure between the worm and sector will force out a thinned lubricant and permit excessive wear at this point.

Storage Battery

The electrical system of a car has much more to do in winter. The stiffness of the lubricant makes the engine harder to crank in cold weather and it generally is 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 a good plan in preparing for the winter season, therefore, to see that the battery is fully charged, that the battery connections are clean and tight, and that the charging rate is sufficient to take care of the requirements of the system. At the same time, the spark plugs, the contact points and the ignition timing should be checked to assure easy starting and smooth performance.

Gasoline System

A small amount of water in the gasoline system during warm weather 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 carburetors. It is important, therefore, to clean the filter and the strainers in the gasoline system before the start of cold weather. (See page 55.) It is also advisable to check the adjustment of the carburetors and the operation of the choke control.

Starting the Engine

Choke Button

Gasoline does not vaporize as readily in cold weather as in warm weather 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. This is accomplished by the greater use of the choke control.

For cold weather starting, pull the choke control button all the way out until the engine starts. After the engine starts push the control button part way in. Experience will show the correct place to set the control, which will depend to some extent on the temperature. As the engine warms up the control button should be pushed further in until it has been pushed all the way in. The choke should not be left out any longer than necessary.

Position of Throttle Hand Lever

The throttle hand lever should be left in the fully "closed" position for starting in any weather, but this is particularly important in cold weather. With the throttle in the closed position the proportion of gasoline to air is greater which is essential to easy starting. If the throttle is opened, the proportion of air is increased, giving a lean mixture more difficult to ignite.

Priming the Carburetors

In extremely cold weather the carburetors may be primed by quickly depressing and releasing the accelerator pedal a few times. This procedure sprays gasoline into the intake chamber and provides a richer mixture. The carburetors should never be primed in warm weather or in cold weather when the engine is warm. Excessive priming at any time is likely to make starting difficult rather than easy.

Use of Starter

It is a good plan to disengage the clutch during the cranking operation in winter weather to relieve the strain on the battery.

With the clutch disengaged the starter is not called upon to turn the transmission gears which are immersed in lubricant. At ordinary temperatures the resistance created by the gears turning in the lubricant is negligible, but in cold weather, when the lubricant is stiffened considerably, the strain is sufficient to retard the cranking speed and increase the demand on the battery.

Use of the Accelerator Before Engine is Warm

In cold weather, after the engine is started and before it has run long enough to become warm, the engine cannot deliver its normal power and should not be called on to do so. Although the choke control can be used to keep the gasoline mixture in the proper proportion for smooth driving while the engine is cold, the throttle should not be opened too suddenly or too far. This merely invites "popping back" in the carburetors and increases the amount of excess unvaporized gasoline in the combustion chamber. Unvaporized gasoline in the cylinders washes the oil off of the pistons and cylinder walls, leaving the surface unprotected and open to scoring.

CHAPTER V

EQUIPMENT

The equipment provided on the Cadillac V-16 is designed for the comfort, convenience and protection of the occupants. The driver, therefore, should acquaint himself with the operation of the equipment described in this chapter so that he may derive full benefit from its use as occasion demands.

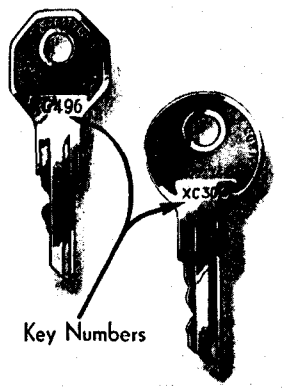


Fig. 24. A record should be kept of the key numbers so that new keys may be easily obtained in case of loss.

Locks and Keys

The locks on the car are for protection against theft, and full use should be made of this protection whenever the car is to be left unattended for any length of time whatever.

Two sets of two keys each, which may be distinguished by the shapes of their handles, are provided with the car. Two different keys are provided so that the owner may leave the car temporarily in the hands of another operator without foregoing the protection of the various compartments.

The handle of one key is hexagonal in shape while the other is rounded. The hexagonal shaped key operates the combination ignition switch and transmission lock, the right front door and the spare wheel carrier. The key with the rounded handle operates the instrument panel package compartment lock, the rear deck lock, the golf compartment lock on roadsters and

coupes, the trunk lock on town sedans and 5-passenger coupes, and the rear door lock on town cars and imperial sedans.

Each key has the lock number stamped on the handle, as shown in figure 24, but this number does not appear on the lock. The owner should make a record of the key numbers as soon as he takes delivery of the car so that in case both keys are lost, a duplicate key may be easily obtained from a Cadillac distributor or dealer.

Ignition Switch Lock

The ignition switch lock is located in the center of the instrument panel. When the key is placed in this lock and is turned, the cylinder of the lock slides out about one half an inch, turning on the ignition. Turning the key to the locked position and pushing the cylinder all the way in shuts off and locks the ignition.

This lock is also connected to the transmission through a cable. The transmission is thus automatically locked when the ignition is turned off, but the construction of the cable connection at the transmission is such that the car can be locked only in neutral or reverse. No attempt should be made to turn off the ignition when the transmission is in any forward speed.

Be sure to remove the key before leaving the car.

Door Locks

All the doors of the car can be locked from the inside by tilting the inside door handles up above their normal closed position. The driver, however, cannot lock himself out because only the right front door can be locked from the outside.

If the driver leaves the car through any door other than the right front door, the lock will be automatically released as soon as he shuts the door. The right-hand front door lock operates similarly, but it can be locked from the outside with the key. To lock the car completely, the driver must go out through the right-hand front door after the handles of all the other doors have been

tilted up. The right-hand front door must then be locked from the outside with the key.

Package Compartment

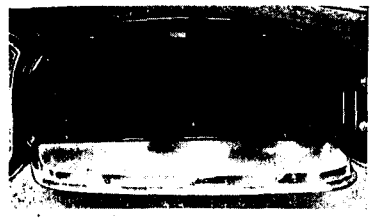


Fig. 25. The compartment on the right-hand side of instrument panel may be used or carrying small articles.

A compartment is provided at the right hand side of the instrument panel for the convenience of the driver in carrying small articles where they will be readily accessible. Maps, gloves, small packages and other articles can be carried there within easy reach. The Operator's Manual should be carried in this compartment to be available for handy reference. The door of the compartment swings down to a horizontal position for convenience in resting maps or making notes.

Interior Lights and Switches

A map lamp which may be turned on by pulling it straight out is located so that it may be used to illuminate the driving compartment for reading maps or making notes when driving at night. This lamp is located at the top of the center panel directly above the ignition lock and the choke button. It may be turned around in its socket toward either side to throw the light in any direction desired.

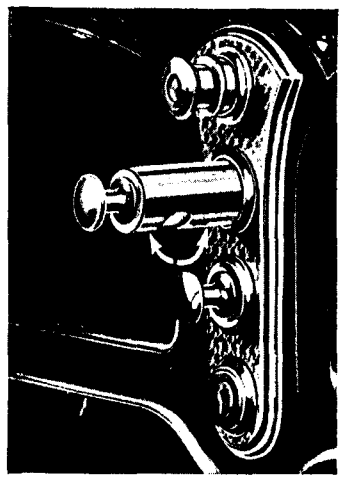


Fig. 26. The map lamp may be turned to either side.

Dome lights on sedans and town cars and quarter lights on coupes turn on automatically when the doors are opened. When the doors are closed the lights are turned off, but they may also be turned on and off, when the doors are closed, by a switch located on the right-hand door pillar. Quarter lights on cars having dome lights do not operate with the doors but can be controlled by a switch on the left hand rear door pillar.

Phaeton and All Weather Phaeton cars have a tonneau light operated by the door and by a switch integral with the lamp. Deck compartment lights in roadsters and convertible coupes are operated in a like manner.

A chart of bulbs for replacement on all of these lights will be found on page 63, chapter VI.

No-Draft Ventilation

Cadillac V-16 closed cars are provided with the "No-Draft" system of ventilation which makes it possible for any occupant, while the car is moving, to control the circulation of air in the area of the car in which he is seated without noticeably affecting any other area. This is accomplished by means of the laterally operated ventilators in the front compartment windows and in the rear-quarter windows in the rear compartment.

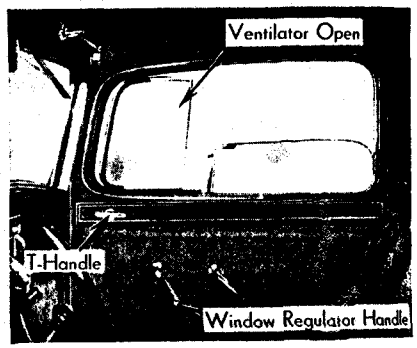


Fig. 27. The window should be lowered about half way when opening or closing the ventilator.

The No-Draft ventilators are operated by the T-handle just below and toward the front of the windows as shown in the illustration. The ventilator may be turned in or out to obtain the desired circulation by turning this handle.

Important: To operate the No-Draft ventilators in the front compartment windows, first lower the window half way, as shown in the illustration, in order to release the ventilator from the channel section of the window glass. The ventilator may then be turned to any desired position and the window may be raised.

In order to make sure the car is safe against intrusion when the car is to be locked, the ventilators should be closed. In closing the front compartment ventilators, first lower the window half way, shut the No-Draft ventilator, and raise the window. This securely locks both window sections.

The front compartment is provided with a weather-proof cowl ventilator in addition to the No-Draft system. This ventilator is controlled by the knob at the right-hand side of the steering column and may be opened for increased air circulation in the front compartment as desired. The design of the cowl ventilator is such that it may be kept open in any weather, without possibility of rain entering the driving compartment.

Windshield Cleaner

The windshield cleaner consists of two wiper blades operated simultaneously by suction from a vacuum pump on the engine. On closed cars the wipers are controlled by one push button located on the header board above the center of the windshield. On open and convertible cars, each wiper is controlled separately by the two buttons located on the cowl at each side of the center section above the instrument panel.

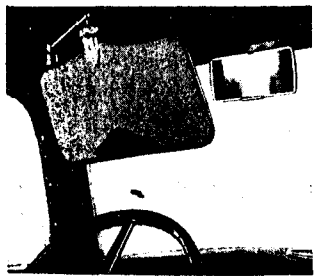


Fig. 28. The sun visor may be turned and tilted in any direction.

Sun Visor

A sun visor is provided on each side of the driving compartment to protect the occupants from the glare of the sun. The visors operate on a universal joint and can be turned down or up or tilted to either side to give the protection desired.

Adjustable Seat

The driver's seat on closed cars may be adjusted to suit individual requirements in giving the most comfortable reach to the controls. A crank located on the left-hand side of the driving compartment at the seat base just above the floor boards, operates the control mechanism. The rear seat on some chauffeur driven cars is adjustable also. The adjustment on these seats is controlled by a T-handle at the center of the seat base just above the floor boards.

Cigar Lighter

Cordless lighters are provided on the instrument panel and in the smoking sets of the various body styles. These lighters have a green translucent button through which the glow of the heating element may be seen when the lighter is ready for use. To use a lighter, press it all the way into its socket and hold it there until the glow of the heating element is seen; then lift it out.

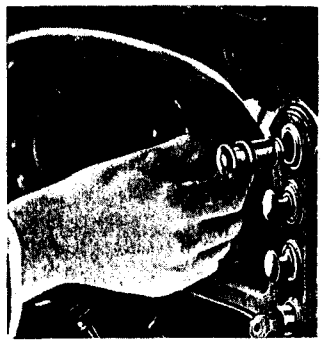


Fig. 29. To operate the cigar lighter press it in its socket, hold until the glow is seen; then remove it.

Tools

A compartment for the tools is located under the front seat except in 5-passenger coupes. In these cars it is located under the rear seat. A compartment for tire chains is provided in the left hand front fender corresponding to the battery box on the right-hand side.

It is important that the tools be placed on the tool compartment in such a way that they do not interfere with the proper placing of the seat cushion or with the seat adjusting mechanism. The jack should be placed under the driver's seat with the base toward the rear and the remainder of the tools should be arranged as shown in figure 30.

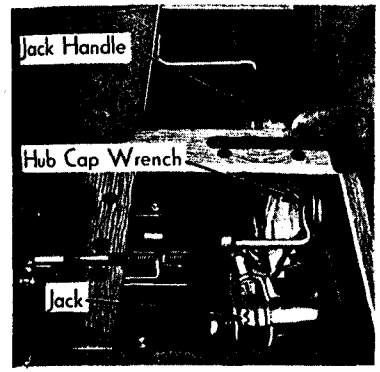


Fig. 30. Arrangement of the tools in the tool compartment.

Tool equipment provided with the car is as follows:

- Hammer
- Large Screw Driver
- Small Screw Driver
- Pliers
- Spark Plug Wrench
- Crescent Adjustable Wrench
- Jack Handle
- Jack
- Hub Cap and Wheel Mounting Wrench
- Tool Bag
- Operator's Manual

Tires

For normal driving the front and rear tires should be inflated to a pressure of 40 lbs. *Important*—On cars driven at high speeds, the front tires should be inflated to 45 lbs.

The tires should be checked at least weekly and brought up to the recommended pressure if necessary. The pressure should never be permitted to drop more than five pounds. If this precaution is taken tire wear will be kept at a minimum.

It is necessary to remove the hub cap to inflate the tires on V-16 cars. The full proceduce is explained on page 59, Chap. VI.

Use of Jack

When a tire is flat, the axle is not always far enough above the ground to permit placing the jack directly under the axle. In such cases the jack should be placed under the spring, as shown in Fig. 31, as near the axle as possible.

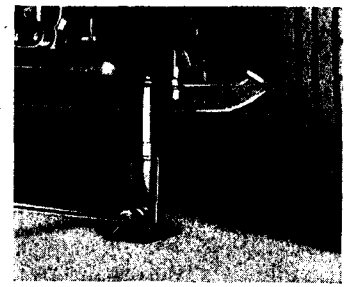


Fig. 31. The jack should be placed under the spring as near the axle as possible.

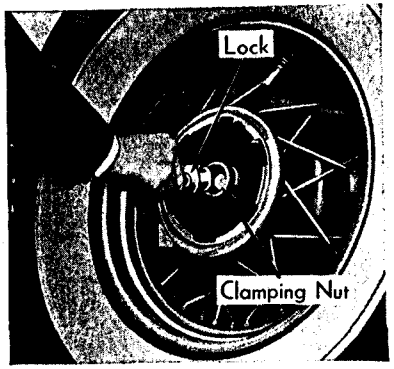


Fig. 32. The clamping nut may be reached after unlocking and removing the lock.

Spare Wheel Carrier

To remove a spare wheel from the carrier either on the rear of the car or in the fenders, first remove the hub cap by removing the knurled nuts from the hub cap studs, shown in Fig. 33, which can be reached from the body side of the wheel; then unlock the lock and take it out, using the key as a handle. It may be necessary to hold the lock while turning the key. Unscrew the clamping nut underneath the lock. On cars with the wheel carrier in the rear, the wheel may then be lifted off. On cars with fenderwell carriers, however, the clamping knob on the brace rod must first be loosened by turning to the left until the wheel may be cleared from the brace rod as shown in Fig. 34, and lifted off.

To reinstall a spare wheel on the rear carrier, mount it on the carrier, reinstall the clamping nut, snap the lock back into place and place the dust shield in position. On fenderwell carriers, place the wheel in the well, screw the clamping knob on the brace rod down until the clamping screw can be pushed into position and install the clamping nut. Reinstall the lock and the hub cap, then screw the brace rod clamping knob down until the wheel is held solidly in place.

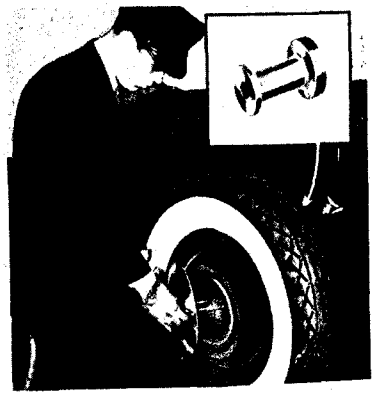


Fig. 33. The knurled nuts holding the two hub cap studs can be reached from the body side of the wheel.

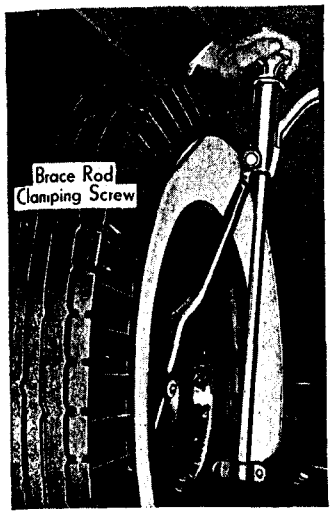


Fig. 34. The spare wheels on cars with fenderwell carriers may be removed after loosening the brace rod clamping screw.

Changing Wheels

If a fully inflated spare tire is always carried, it is only necessary, in case of tire trouble, to remove the wheel with the flat tire and install the spare wheel in its place. Illustrated directions for performing this work are given in figure 35, page 50.

In case tire trouble develops when no spare is available, the tire can be easily removed from the drop-center rim for repair. Instructions for removing and installing tires on the wheels are given on page 59, Chapter VI.

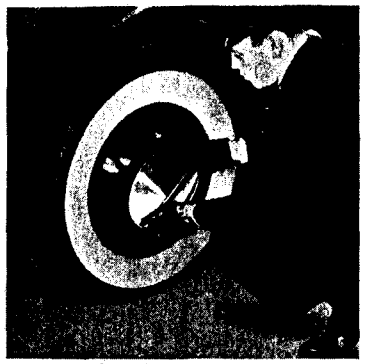


Fig. 35a. Remove the hub cap by turning toward the left until the catch loosens. In some cases it may be necessary to tap the hub cap with a hammer to loosen it, using a small block of wood to protect the finish. Set the hand brake lever to prevent the car from rolling and jack up the axle.

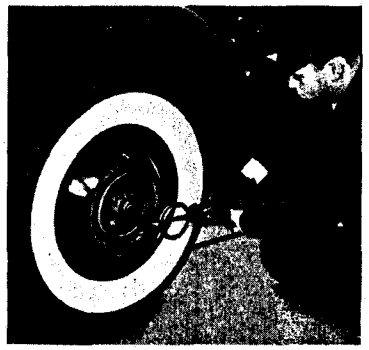


Fig. 35b. Loosen the nuts around the wheel hub by turning them in a counter clockwise direction with the wrench. Remove the nuts and pull the wheel off of the hub.

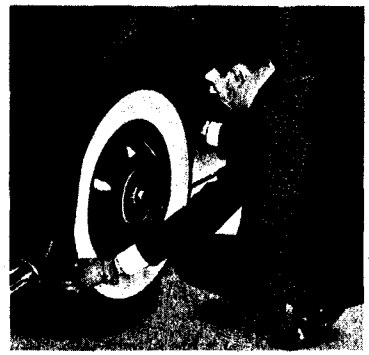


Fig. 35c. To remount the wheel, set it up on the hub and start the nuts by hand; then tighten the nuts with the wrench, but not in rotation. After tightening one nut, tighten the nut directly opposite until all have been securely drawn up. Replace the hub cap, making sure it is securely caught, and lower the jack.

NOTE: In drawing up the nuts to the last turn, a slight alternate increase and decrease in resistance may be noticed which simply indicates that the locking feature is taking effect. After all the nuts have been tightened, they should again be tried to make sure that none has been resting on a high point without being sufficiently tight.

Fig. 35. Changing Wheels

CHAPTER VI

GENERAL CARE

NO ATTEMPT has been made to include in this manual directions for making adjustments and repairs to the car. Most Cadillac owners prefer to depend on authorized Cadillac-La Salle service stations for such work 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 also can be done in the service station if desired.

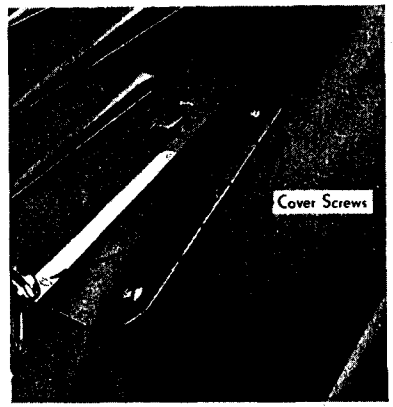


Fig. 36. The cover of the battery compartment is held by four screws.

Storage Battery

The Delco Storage battery is carried in a compartment in the right-hand front fender. The battery may be reached after removing the four screws and taking off the cover shown in figure 36.

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 least every two weeks. Hydrant water or water that has been in contact with metallic surfaces is not satisfactory.

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

No attempt should be made to add acid or any so-called "rejuvenator solution" to the battery. Adding anything other than distilled water will materially shorten the life of the battery.

The specific gravity of the acid solution changes as the battery is charged and discharged. The state of charge of the battery can thus be determined by measuring the specific gravity of the solution with a hydrometer. As the battery is charged, the specific gravity of the solution increases, reaching 1.270 to 1.285 when the battery is fully charged. A fully discharged battery has a specific gravity of 1.150 to 1.165.

An accurate test cannot be made immediately after adding distilled water. The hydrometer reading should be taken before water is added, or, if the solution is so low that it cannot be reached, distilled water should be added to bring the solution up to the proper level and the car run for several hours until the solution is properly mixed before the test is made.

Generator Charging Rate

Current is supplied to the battery from a generator driven by the engine and the generator charging rate must be high enough to keep the battery charged. Under normal operating conditions, if a hydrometer test shows the battery is low, the charging rate should be checked and adjusted at a service station. If the test shows the battery is extremely low, it should be recharged from an outside source before continuing to drive the car.

Winter driving places greater strains on the battery than summer driving and the generator charging rate should be adjusted to take care of the increased demands. If the maximum charging rate is not sufficient to take care of this extra load, arrangements should be made to have the battery charged from

an outside source periodically to insure dependable operation throughout the winter months.

Spark Plugs

The spark plugs provide the spark which ignites the gasoline mixture in the cylinders, and smooth and economical engine performance depend largely upon their efficiency. The accumulation of carbon and improper gap setting are generally the cause of inefficient spark plug operation. Their efficiency can be increased in such cases by cleaning out the carbon and by resetting the gap.

To clean carbon from the insulator, fill the lower part of the plug with alcohol, liquid metal polish or equal parts of ammonia and water and allow it to stand for a few seconds. Rub the carbon from the insulator with a wire covered with one thickness of cloth; then wipe it clean and dry before replacing the spark plug in the engine.

Whenever spark plugs are reinstalled in the engine, the firing points should be tested to make sure they are properly spaced. The gap should be .025 to .028 inches, measured with a feeler gauge. All adjustments of the gap should be made by moving the side wire only.

Cooling System

The radiator filler is located on the left hand side of the engine under the hood. The capacity of the cooling system is 7 gallons when filled to a point about 1½ inches below the top of the filler neck. When the car is delivered to the owner the cooling system contains, in addition to the

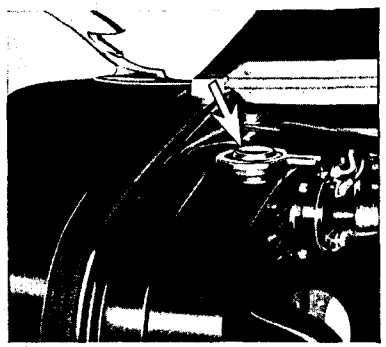


Fig. 37. The radiator filler cap is on the left hand side of the car under the hood.

water and whatever anti-freeze is used, a small amount of a special oil which gives the cooling liquid a milky appearance. This oil has particular advantages in reducing foaming and retarding the formation of rust and scale, thus helping to keep the cooling system clean so that it will better perform its cooling action. It is not necessary to add the oil each time water or anti-freeze is added. Whenever the cooling system is drained and refilled, however, it is recommended that ⅓ of a pint (about 6 ounces) of a suitable inhibitor be added. More than this should not be added as too much may result in foaming, defeating the purpose for which it is intended. See an Authorized Service Station for recommendations on the proper oil to use for this purpose.

In freezing weather a suitable anti-freeze solution, such as those described on page 34, should be used. The special oil, although it has no anti-freezing qualities in itself, will blend satisfactorily with any approved anti-freeze but should not be used with any solution already containing a similar inhibitor. (See page 36.) Allowances must, of course, be made when testing the cooling solution for the effect the special oil has on its specific gravity.

Before the start of cold weather, the cooling system should be cleaned and thoroughly inspected to make sure all connections are tight. If the special oil is used this cleaning will suffice for the entire year; otherwise it is advisable to clean it thoroughly every 6000 miles, using the reverse flow method which is standard at all Authorized Cadillac-La Salle Service Stations.

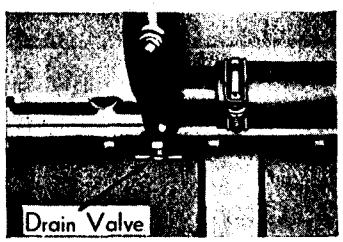


Fig. 38. The cooling system may be drained by opening the one valve.

If this is not possible a satisfactory cleaning, although not as effective as the reverse flow-method, may be obtained by using the following procedure:

Run the engine until the opening of the radiator shutters indicates that the engine is warm; then stop the engine and open

the drain valve on the right-hand side of the engine at the water inlet elbow below the water pump shown in figure 38. After the liquid has drained off, refill the cooling system with warm water, run the engine for a few moments, and drain the system. Repeat this operation until the water is clean when it is drained.

In cases where the accumulation of rust and scale is so great that this method does not clean the system sufficiently, the flushing operation should again be repeated after one or two handfuls of sal soda have been added. Care must be taken, of course, that the cooling system is thoroughly flushed after this operation to clean out all traces of the sal soda, and that none of the solution is allowed to reach the car finish.

The water packing in the Cadillac V-16 water pump is accessible only after the entire propeller shaft has been removed. The packing which may be seen after the gland nut is removed is simply a grease packing and has little control over water leakage. Ordinarily, tightening of the gland nut will be sufficient to stop any leakage, but if it is necessary to repack the pump, it is advisable to take the car to an Authorized Service Station. In tightening the gland nut, it should be drawn up tight with a wrench, then backed off until it is entirely free and again drawn up to a point when it can just be felt to make contact with the packing.

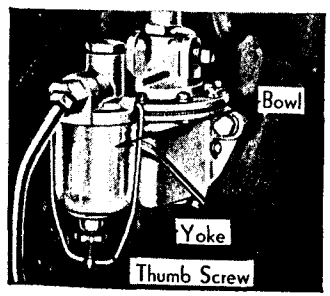


Fig. 39. The gasoline filter should be removed and cleaned whenever water or sediment appears in the bowl.

Gasoline System

A gasoline filter is provided at the bottom of the fuel pump on the front left-hand side of the engine. Any accumulation of water or sediment should be cleaned out when it can be seen in the glass bowl.

The bowl may be removed by unscrewing the thumb nut on the underside of the bowl and

swinging the yoke to one side. The screen strainer at the top of the bowl usually comes off with the bowl but if it does not, it may be removed by pulling it straight down.

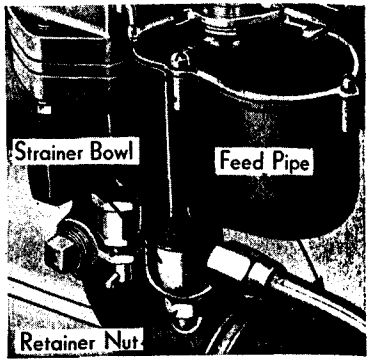


Fig. 40. The strainer in the carburetor may be removed with the bowl by disconnecting the feed pipe and removing the retainer nut.

Any dirt on the strainer should be washed off with gasoline and the bowl should be wiped clean. The bowl should then be reinstalled with the screen on top. Make sure the bowl seats properly against the cork gasket at the top of the filter, swing the yoke into place and tighten the thumb nut.

The strainer on the carburetor where the gasoline enters should also be cleaned periodically. It may be removed by disconnecting the feed pipe and unscrewing the nut at the bottom of the bowl shown in figure 40. Both the strainer and the sediment chamber should be cleaned in the same manner as the gasoline filter.

Carburetor Air Cleaner

The carburetor intake silencers mounted on the dash serve also as air cleaners. These cleaners are designed to catch any dust or lint in the air before it is drawn into the carburetors. They are automatic in operation and require no attention other than periodic cleaning.

The mileage at which the air cleaner requires attention depends entirely upon the conditions under which the car is operated. For normal driving in cities and on hard surfaced roads, cleaning once every 6000 miles is sufficient. Under extreme conditions, however, such as continuous driving on dusty roads or in localities where there is considerable dust in the air, cleaning may be required as frequently as every 2000 miles.

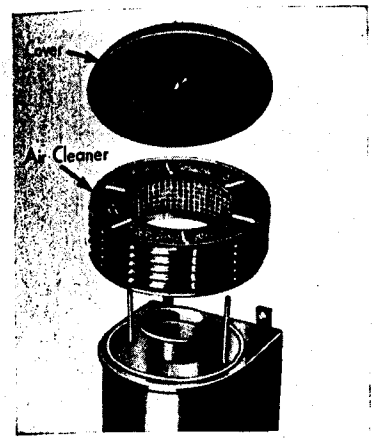


Fig. 41. The cover to the air cleaner and silencer should not be washed under any circumstances.

The air cleaner may be lifted out, as shown in figure 41, after the covers of the intake silencers have been removed. The cover of each silencer is held by two acorn nuts. After the air cleaners have been removed they should be thoroughly washed in gasoline, permitted to drain and then dipped in fresh engine oil. *Do not wash the cover.* They may then be reinstalled by placing them in the top of the silencer cylinder and replacing the cover.

Oil Filter

The oil filter, located at the rear of the engine on the right-hand side, is of the self-cleaning disc type. The engine oil, on the way to the valve mechanism, passes through this filter, depositing all impurities and foreign particles in the receptacle. A connection to the starter automatically slightly rotates the discs every time the starter pedal is depressed. The filter should be drained every 6000 miles to prevent the accumulation of foreign matter from clogging the discs and allowing the unfiltered oil to reach the working parts of the engine.

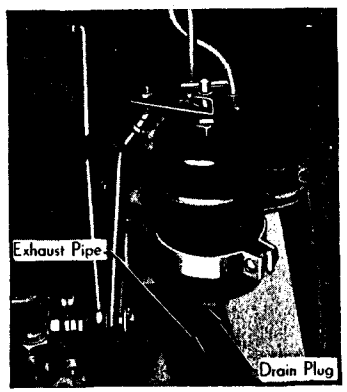


Fig. 42. The exhaust pipe should be shielded when the oil filter is drained.

The filter may be drained by simply removing the plug shown in figure 42. A funnel or shield should be used to prevent the oil and sludge from getting on the exhaust pipe where it will cause unpleasant odors when the engine warms up. If any is accidentally spilled on the exhaust pipe it should be thoroughly wiped off.

Brakes

The importance of the proper operation of the brake system as an essential measure of safety is so great that all service on it should be performed at a service station where proper adjustments and tests can be made with the greatest accuracy. Adjustment should never be neglected so long that the pedal reaches the floor board before the brakes take effect. In case of emergency, however, should this occur, the following temporary adjustment can be made by the driver.

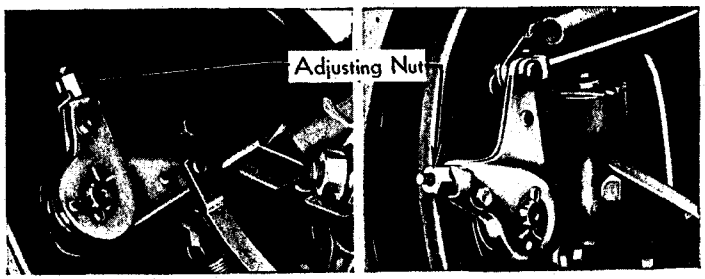


Fig. 43. A temporary brake adjustment can be secured by turning the adjusting nut on each brake one-half a turn clockwise.

Turn the adjusting nut on the cam lever, shown in figure 43, of each of the four brakes one half a turn in a clock-wise direction. These adjusting nuts lock each sixth of a turn to hold the adjustment.

A permanent adjustment should be made as soon as a service station can be reached.

Tires

The most important factor in the life of a tire is its inflation pressure. Each tire should be tested at least once a week and the pressure should be kept at 40 pounds front and rear; if the car is to be used for high speed driving the pressure of the front tires should be increased to 45 pounds.

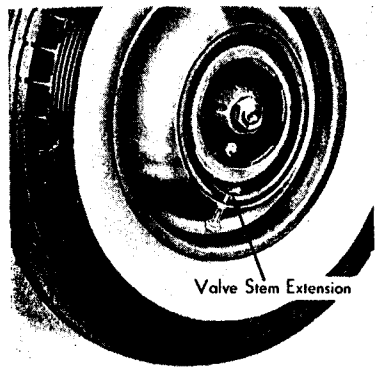


Fig. 44. The valve stem may be reached for inflating the tire by removing the hub cap.

In order to reach the valve stem to inflate the tires, it is necessary to remove the hub caps. This may be done by turning the hub cap to the left until the catch is felt to release, and then pulling the cap straight out. In some cases it may be necessary to tap the flange of the hub cap with a hammer, using a block of wood to protect the finish, in order to loosen it.

With the inflation pressure properly maintained injuries to the tire structure will be kept at a minimum. Severe cuts, however, caused by sharp obstructions in the street or on the road, will invariably appear. If these cuts are neglected, the action of the weather and grit and gravel will in time weaken the tire around those points. If the cuts are sealed immediately by a good vulcanizer, however, these points will be protected and the life of the tire will be lengthened.

Removing Tires from Wheels

The wheels used on the Cadillac V-16 have rims of the drop center type, constructed as shown in figure 47. The tires supplied with this type of wheel have a soft rubber tip on the bead to protect the tube from chafing and a hoop of wire inside the bead

Fig. 45a. Deflate the tube completely and remove the rim nut on the valve stem. Where metal discs are used on the wheels, it will be necessary to remove the valve stem extension by unscrewing the knurled nut. Loosen both beads from the bead seats, using a tire tool if necessary. Stand on the tire, opposite the valve stem, with the feet about 15 in. apart, to force the bead into the rim well.

Fig. 45b. Insert two tire tools, about 8 in. apart, between the bead and the rim flange near the valve. Leaving one tool in position, pry short lengths of the bead over the flange with the other until the entire bead has been removed.

Fig. 45c. Remove the inner tube before attempting to remove the second bead. Raise the wheel to an upright position, insert a tire tool between the second bead and the rim flange at the top side of the wheel and pry the wheel out of the tire. This operation will be simplified if the soft tip of the bead is first coated with vegetable oil soft soap.

Fig. 45. Removing Tire

Fig. 46a. Coat both beads of the tire with vegetable oil soft soap before reinstalling the tire. Inflate the tube until barely rounded out and insert in the tire with the stem at the tire balancing mark. Place the tire on the rim, guiding the valve through the hole, and apply the rim nut loosely. Push the bottom bead down into the well at the valve and force the remaining portion of the bead over the rim flange, using a tire tool if necessary.

Fig. 46b. Force the top bead over the rim flange and into the well at the point opposite the valve. Kneeling on this side of the tire to hold it in the well, pry short lengths of the remaining portion of the bead, working around the rim until the entire bead is in place. Always keep as much of the top bead in the well as possible while prying the remainder of the bead.

Fig. 46c. Remove the rim nut and push the valve stem back into the casing as far as possible, without letting go of the stem, to make certain that the tube is not pinched under the bead; then reapply the rim nut and the valve stem extension. With the wheel flat on the floor, inflate the tire slowly, making sure that both sides of the tire are centered on the rim.

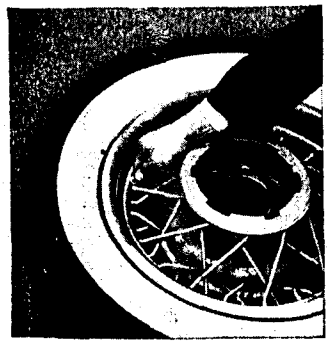


Fig. 46. Reinstalling Tire

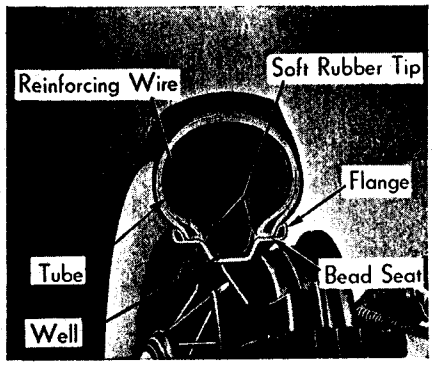


Fig. 47. **Principal features of the drop center rim and special tires.**

to maintain the shape of the tire.

The removal and installation of tires on the drop center rim is simple and easy, because the bead can be pushed down into the well on one side while it is being pulled over the flange on the opposite side. Illustrated directions for removing and installing tires are given in figures 45 and 46. Care must be taken in removing and installing the tires not to damage the soft rubber tip or to break or unnecessarily strain the hoop of wire. If prying the bead over the flange seems to require too much force it is an indication that the bead is not down in the well on the opposite side of the wheel.

The changing of tires on drop center rims is made easier by coating the inside and outside of the bead as required with a vegetable oil soft soap. *Do not use oil or grease.* If it is applied each time a tire is changed there should never be any difficulty in removing or installing the tire. If, when removing the tire, however, some difficulty is experienced in removing the second bead, coating the bead with the vegetable oil soft soap will make the removal easier.

Tire Balancing Marks

The tires used on the Cadillac V-16 are balanced to offset the weight of the valve stem and if a tire is removed it must be reinstalled in its original position with respect to the rim, otherwise the tire and wheel will be unbalanced.

A small red or black dot branded in the side wall of the tire indicates the point of balance. This mark must always be kept in line with the valve stem.

Lights

In replacing lamp bulbs in any of the lights on the car, the same candle power bulb should be used for replacement as was originally installed. This is particularly important in the case of the headlamps in which a special 3-filament bulb is used. It is a good plan to carry a spare set of these lamp bulbs at all times in the car.

The lamp bulbs used in the car are as follows:

Location	Voltage	Candle Power	Mazda No.
Headlamps	6-8	32 21 (three filament) 21	3001
Rear Lamps (signal position)	6-8	15	87
Rear Lamps (parking driving)	6-8		
Instrument Lamp	6-8	3	63
Map Lamp	6-8		
Fender Lamps	6-8		
Dome Lamp	6-8		
Quarter Lamps	6-8	6	81
Deck Compartment Lamps	6-8		
Tonneau Lamp	6-8		

Replacing Map Lamp Bulb

The bulb in the map lamp may be replaced after the lamp shield has been removed. To remove the shield, pull the lamp out until the threaded terminal at the rear (behind the instrument panel)

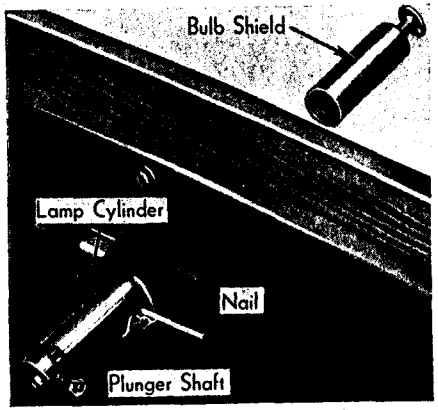


Fig. 48. The bulb shield may be unscrewed after the holes in the lamp cylinder and the plunger have been lined up and a nail inserted to hold the plunger.

is about flush with the edge of the lamp cylinder. Turn the lamp slowly until the hole in the plunger lines up with the hole in the lamp cylinder and insert a small nail as shown in figure 48, to keep the plunger from turning. The shield may then be unscrewed by turning to the left. The nail should be kept in place until after the bulb has been replaced and the shield reinstalled.

SUPERSAFE HEADLAMP ADJUSTMENT

Instructions

SUPERSAFE headlamps must be maintained in efficient condition and in proper adjustment to insure satisfactory performance in service.

Maintenance

Remove both headlamp doors. Clean the lenses with alcohol inside and outside. Carefully wipe all dust from the reflecting surfaces. Polish with a soft rag dipped in a mixture of lamp black and alcohol. Replace gaskets if they are damaged or do not register properly. Replace bulbs if they show signs of blackening. Try the lighting switch in all positions to see that *all* bulbs burn properly, side lamps, tail lamps, etc., included.

Adjustment Set-Up

Locate the car on a reasonably level surface with the headlamps aimed toward and twenty-five feet from a shaded garage door or

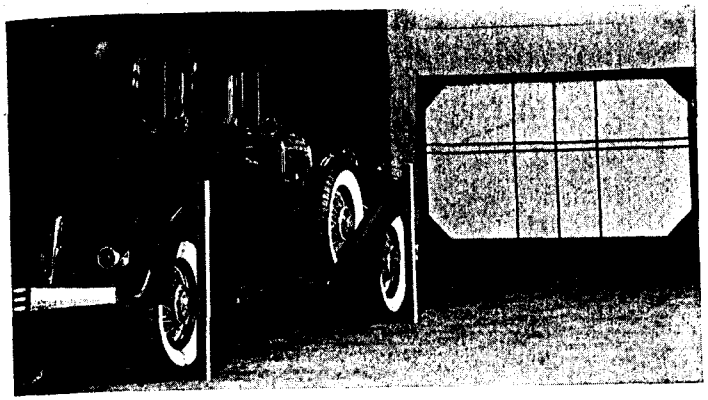


Fig. 49. Adjustment Set-Up showing proper position of car with reference to screen and accurate method of locating level of headlamp centers on screen.

other reasonably light colored vertical surface as shown in Fig. 49. Draw a horizontal line on the screen at the level of the headlamp centers, located by sighting over two uprights, each exactly 40½ inches long, one placed next to one of the front wheels, the other opposite the rear wheel on the same side of the car. This procedure is extremely important. Never trust to luck that the garage floor is truly level. Small variations are magnified enormously by the time they reach the screen. Draw a second line 3 inches below the first. Locate the center point on each of

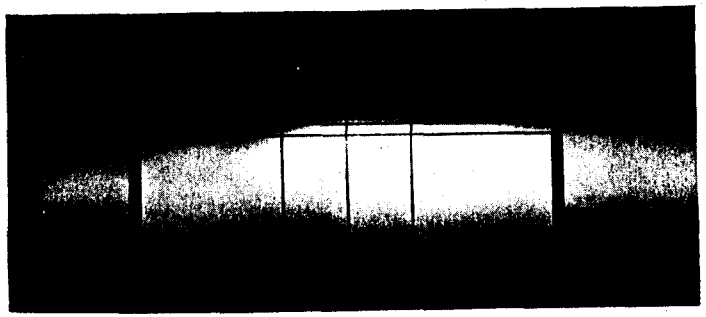


Fig. 50. Composite CITY UPPER BEAM pattern on properly marked adjustment screen.

these lines by sighting through the center of the rear window and over the center of the radiator cap. Draw vertical lines 16 inches to either side of this center point, directly ahead of each lamp. The proper marking is shown in Fig. 50.

Fig. 51. SUPERSAFE CITY UPPER BEAM with lens removed.

Focusing the Lamps

Fixed-focus head lamps need no focusing but better results will be obtained if the switch is turned to the "City Upper Beam" position and several bulbs are tried until one is obtained which produces a beam pattern like that shown in Fig. 51, with the hot spot as bright and as near the top of the beam as possible. When this operation is completed fasten the doors in place.

Aiming the Lamps

For the best results SUPERSAFE headlamps must be aimed properly and accurately. Loosen the nuts which secure the lamps to the mounting brackets. Place the switch on the "City Upper Beam" position. Cover one headlamp while working on the other. First, rotate the headlamp in the mounting joint to line up the flutes vertically and make the beam pattern horizontal. Aim the right headlamp so that it centers on the vertical line of the screen on the right directly ahead of it and so that its upper

Fig. 52. The headlamps may be turned in any direction necessary for aiming after loosening the clamping nut at the base of the lamp.

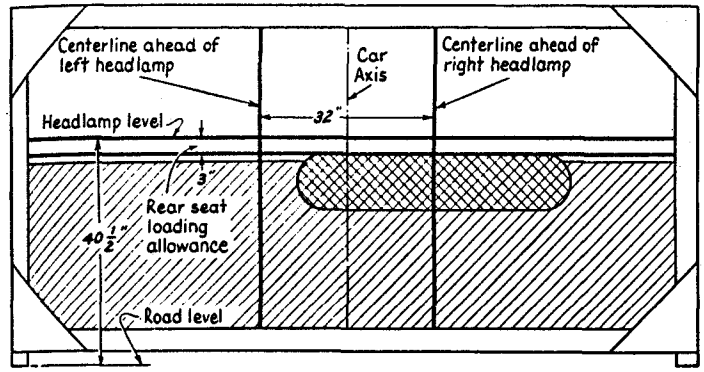


Fig. 53. Right SUPERSAFE CITY UPPER BEAM correctly aimed for unloaded car.

edge registers on the lower horizontal line, as shown in Fig. 53. Secure it in place. Aim the left headlamp so that its left side coincides with the vertical line on the left and its upper edge is on the upper horizontal line, as shown in Fig. 54. Secure it in place. See that the retaining nuts are tight and that the beams have not shifted in the process of tightening. Adjustment of the "City Upper Beam" automatically provides for the proper adjustment of the other three beams. If a so-called "adjusting machine" is

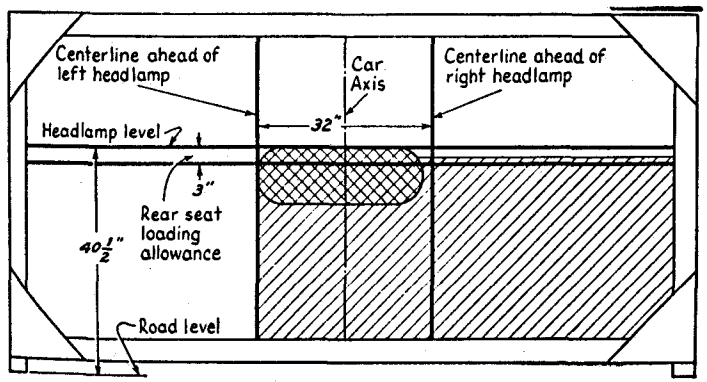


Fig. 54. Left SUPERSAFE CITY UPPER BEAM correctly aimed for unloaded car.

used, be sure and check the results on the screen as above described until you are thoroughly familiar with its operation.

Important

Aiming practices vary in the different states so that no single set of instructions is applicable. The aiming practice described above is the one advocated by the Cadillac Motor Car Company as likely to result in maximum safety and comfort to all concerned. Where some other practice is specified by law or regulation, follow it.

Storing the Car

If the car is to be stored for any length of time it is important that a few precautions be taken to protect it from deterioration. Blocking up the car to take the weight off of the tires and placing a cover over the entire body will protect the tires and finish. The engine and the storage battery, however, require special attention.

Oil should be injected into the cylinders while the engine is warm. This may be done by pouring two or three tablespoonsful of engine oil into the spark plug holes after the engine has been run long enough to warm it up. Cranking the engine a few times after this is done will distribute the oil evenly over the pistons and cylinder walls. The cooling system should then be drained.

The battery should be fully charged and the solution should be at the proper level. If possible, arrangements should be made to have the battery charged from an outside source every two months during the storage period.

Body

The body of a Cadillac car is deserving of care and attention the same as the most intricate working parts of the chassis. In

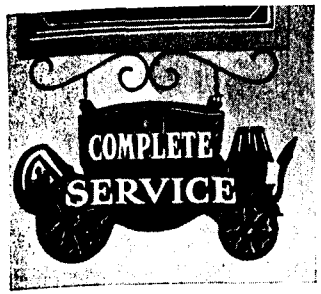


Fig. 55. Authorized Cadillac-La Salle Service Stations displaying this sign are equipped to render complete body service.

recognition of this fact, Authorized Cadillac-La Salles Service stations displaying the *Complete* Service Sign, shown in figure 55, at the bottom of the Authorized Service Sign have equipped themselves to service the body with as much expert skill and care as the chassis. The simple attentions described below, however, are frequently performed by the owner or under his immediate supervision.

Care of the Finish

Keeping the lacquer finish of the car new and lustrous requires only a thorough wiping with a soft dry cloth every few days and an occasional polishing with a recognized lacquer polish. With this care, the car will need to be washed only when considerable mud or dust has accumulated.

Washing of the car can be accomplished simply and easily with plenty of clean cold water, a soft wool sponge and a clean chamois. Soap and hot water are not only unnecessary but undesirable. The dust or mud should be flushed off with a *gentle* stream of water from a hose without a nozzle, using the sponge merely to loosen the dirt. After all the dirt has been removed in this way, the sponge should be squeezed dry and used to pick up the water from the crevices. Thoroughly wet the chamois and squeeze it dry, then rub the finish with it until all of the water has been removed.

Care of the Top

The top may be kept clean by an occasional wiping to remove the dust. This is all the care required to keep the top clean unless

grease spots, stains or dirt film occur. In these cases washing with a mild, neutral soap may be resorted to. Gasoline, naphtha, kerosine and fabric cleaners should never be used since such preparations can easily dull the finish and damage the fabric. Soap and water is not harmful and is fully as effective.

Cleaning Upholstery

Regular monthly cleaning of the car interior with a vacuum cleaner and a whisk broom will keep the upholstery in the best of condition and will prevent excessive wear. The whisk broom should be used to loosen the dirt and grit, which causes more rapid wear than use, while the vacuum cleaner should be used to lift out the loosened dirt.

Spots on the upholstery may be cleaned with any good dry cleaner used sparingly. When the cleaner has thoroughly evaporated, fold a piece of cheese cloth four or five times, dampen it, and place it over the spotted surface; then run a hot iron over surface just long enough to raise a good steam. Plush fabrics can be restored to their original appearance by rubbing lightly against the nap with a brush after the fabric has been steamed in this way.

Door Hardware

The lubrication of the body hardware on the car is fully as essential as the lubrication of chassis parts if it is to work smoothly and silently. Directions for the lubrication of door locks, hinges and striker plates every 1000 miles are included on the lubrication chart. These directions should be followed as faithfully as the rest of the chart.

Body Adjustments

Preventive service on the body at regular intervals will keep the appearance of the car at its best and will eliminate more extensive

repairs at a later date. This service should include body bolts, tie-down bolts, door adjustments and the operation of window regulators.

Authorized Cadillac-La Salle service stations include the body as well as chassis in the regular monthly or 1000 mile inspection and quote flat rate prices for necessary body service. The necessary work may be authorized by the owner at the time he has chassis adjustments made and the car lubricated.

CHAPTER VII

SPECIFICATIONS AND LICENSE DATA

Type of engine	16 cyl. V-type
Diameter of cylinder bore	3 in.
Length of stroke	4 in.
Piston displacement	452 cu. in.
Horsepower (N. A. C. C. rating)	57.5
Engine number	See below
Capacity of gasoline tank	30 gals.
Capacity of engine lubricating system	10 qts.
Capacity of cooling system	7 gals.
Capacity of transmission	2¼ qts.
Capacity of rear axle	3 qts.
Wheelbase	143-149 in.
Tires	7.50 x 17
Spark plug setting	.025-.028 in.
Contact point setting	.014-.018 in.
Generator charging rate, maximum	22-24 amps. cold 13½-16½ amps. hot

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 right hand side of the crankcase on the generator drive chain housing.

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

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

Steering gear number—on the steering gear housing next to the grease plug.

Generator number—on the right-hand side of the generator.

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

Front axle number—on the front surface of the axle I-beam near the right-hand spindle.

Rear axle number—on right-hand side of the axle housing to the right of the cover plate.

Chassis (frame) number—on the flange of the first channel cross-member, next to the left front engine support.

Job and body number—on the right-hand side of the cowl under the hood.

INDEX

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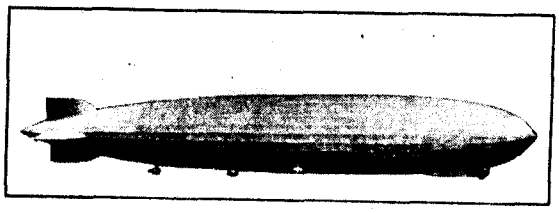
Printed in U. S. A.

V-TYPE ENGINES HOLD WORLD'S RECORDS

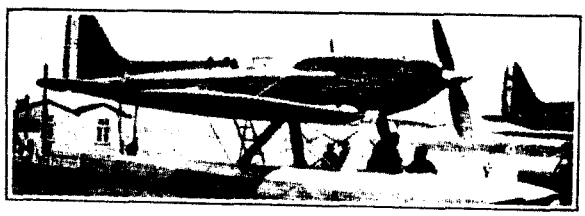
To increase your interest in the V-type principle, you may be surprised to learn that it holds all world's records in the air, on the land, or on the water.

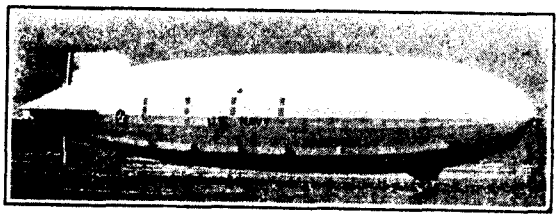


IN THE AIR

The Graf Zeppelin, first lighter-than-air craft to encircle the world, had five V-type engines.

Flight Lieutenant Stainforth, of England, holds the world's aeroplane speed record at 406.99 miles an hour. His plane had a V-type engine.

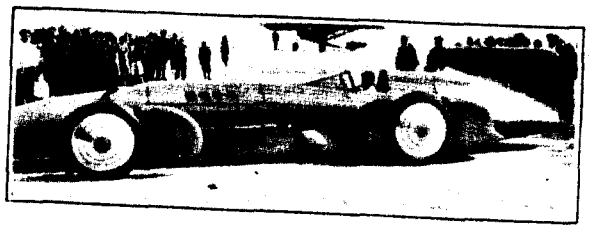


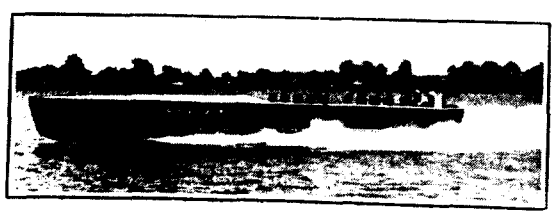


The new U. S. N. Dirigible Akron, the world's largest airship, is powered with V-type engines.

ON LAND

The automobile Bluebird II, driven by Campbell at 245 miles an hour, established the world's speed record on land. It had V-type engines.





ON THE WATER

The world's power-boat speed record of 124.86 miles an hour was made recently by Gar Wood in a boat with V-type engines.

The V-16 *and* V-12 ENGINES

The V-16 Engine

No other engine produced in the entire automobile industry is as smooth, flexible and silent as Cadillac V-16.

It is the supreme achievement of the industry and offers performance that literally is beyond any comparison with any other automobile engine.

The V-12 Engine

The Cadillac V-12 engine inherits many of the superlative qualities of the Cadillac V-16, because it was designed concurrently with the V-16 and shares the same development experience that was responsible for its superior design and efficiency.

Mechanical Features

Both the V-16 and V-12 engines have the same basic principle of engine design. While they differ in size and power development, both engines incorporate the same features of advantage that are responsible for their supremacy over competitive engines of the same size and power rating.

Engine Size and Power {Obj. 40, 41}

V-12		V-16
45° V-type Valve in Head	*Type*	45° V-type Valve in Head
Bore 3⅛"—Stroke 4"	*Size*	Bore 3"—Stroke 4"
368 cubic inches	*Displacement*	452 cubic inches
N.A.C.C. rating 46.9 H.P. Actually develops more than 135 H.P. at 3400 R.P.M.	*Horsepower*	N.A.C.C. rating 57.5 H.P. Actually develops more than 165 H.P. at 3400 R.P.M.
5.6 to 1	*Compression Ratio*	5.7 to 1

Crankcase {Obj. 59, 92}

The crankcase forms the base for the entire power plant as it supports the crankshaft, cylinder blocks and other essential parts of the engine.

It is made of silicon aluminum alloy which gives maximum strength and light weight. The case is non-resonant, and the walls supporting the crankshaft and camshaft bearings are heavily reinforced by ribbing for rigidity. The crankcase and cylinder blocks are separate units, a most important factor in good engine design.

The lower half of the crankcase forms the oil reservoir. In the V-16 it is cast aluminum with ribs on the outside to assist cooling. On the V-12, pressed steel. It may be removed without disturbing any other parts for complete inspection of rods and bearings. Baffle plates prevent oil surge on hills or quick stops.

Engine Mounting

The engines are mounted in the chassis at six points in live rubber. Two supports at the front, two at the center and two at the rear of the transmission. This gives frame rigidity, without sacrificing smooth engine operation.

Cylinder Blocks

Cylinder blocks are made of nickel iron—more expensive than gray iron. Cylinder walls are ground and honed to a glass-like smoothness. This gives exceptional wearing quality and long life, and assures close fitting of pistons that contribute to continued smoothness and quietness. Blocks are interchangeable and are staggered on the crankcase to permit side-by-side mounting of connecting rods.

Crankshaft (Obj. 42, 43)

Crankshafts are forged from carbon steel of high tensile strength, and after being machined to fine precision limits they are minutely balanced on a special balancing machine to $\frac{1}{16}$ ounce-inch limit. V-12 crankshaft weighs 93¾ pounds. V-16 weighs 123½ pounds. Both shafts are 2⅝" in diameter. The short overall length and large diameter reduce torsional vibration and crankshaft whip to a minimum. The shafts are inherently designed with compensators forged integral to reduce bearing loads. To further reduce torsional vibration a special harmonic balancer is used on the front end of the crankshaft. This balancer was developed by the General Motors Research Laboratories, and is of special construction which climate variation will not affect as it does some other types.

The length of the V-12 shaft 30$\frac{25}{32}$", V-16, 39⅝" (from outer ends of front to rear bearings). Because the cylinders are set at a 45° angle the V-16 gives a light power impulse every ⅛ turn of the crankshaft providing smoothness unequalled in any other type or size of engine.

Main Bearings (Obj. 45-47)

The crankshaft is supported on four main bearings in V-12 and five main bearings in V-16. They are steel backed, babbitt lined bearings and due to the special design of the short crankshafts they are relieved of all loads other than the weight of the parts and the power impulses.

The main bearing dimensions are (diameter by length, from the front to the rear of the engine):

V-12 Bearing Sizes

No. 1 2⅝" x 2$\frac{3}{16}$"
No. 2 2⅝" x 1⅜"
No. 3 2⅝" x 1½"
No. 4 2⅝" x 3$\frac{9}{16}$"

No. 3 bearing takes thrust.

Combined length—8⅝".

Total bearing area—71.1 sq. in.

V-16 Bearing Sizes

No. 1 2⅝" x 2$\frac{3}{16}$"
No. 2 2⅝" x 1⅜"
No. 3 2⅝" x 1½"
No. 4 2⅝" x 1⅜"
No. 5 2⅝" x 3$\frac{9}{16}$"

No. 3 bearing takes thrust.

Combined length—10".

Total bearing area—82.5 sq. in.

Because of the sturdy rigid crankshaft, the fewer bearings necessary are wider and retain lubrication much better than a greater number of seven narrow bearings as used in competitive V-12 cylinder engines and nine bearings used in longer engines of straight-8 type. Fewer bearings are easier to align and this also reduces service costs in maintenance.

Connecting Rods

Connecting rods are drop forged from Chrome Molybdenum Steel, and designed for sustained performance at high speeds. They are 9¼" long, center to center, and both ends are diamond bored at the same time to assure accuracy of center distances and parallelism of bearings. Rods may be removed through the bottom of engine without taking off cylinder heads thus lowering service cost.

Lubrication to lower bearings is provided through metered holes in crankshaft and each rod has a rifle drilled passage to the upper bearing so that oil is forced under pressure to the piston pin which is locked in the piston.

Each set of rods is balanced to $\frac{1}{32}$ ounce for the *complete assembly of rod, piston, piston rings, and piston pin,* a most unusual and close precision limit.

Connecting Rod Bearings

Bearings are 2½" diameter and 1⅛" in length.

Pistons (Obj. 50)

Pistons must withstand the direct impact of the explosion and transmit this force through the connecting rods to the crankshaft. They must also be of ample strength to withstand the terrific temperature within the walls of the combustion chamber.

To provide this strength Cadillac uses Molybdenum Cast Iron Pistons, Electro Plated. Through equal expansion with the cylinder block, and by closer fitting, they give much longer life and quieter operation and prevent scuffing and wear common to engines with softer pistons of aluminum material.

Piston Rings

V-12 pistons have two compression and one oil ring above and one oil ring below piston pin.

V-16 pistons have three compression rings above and one oil ring below piston pin.

Wrist Pins

V-12 are $\frac{7}{8}''$ diameter and $2\frac{15}{16}''$ length.
V-16 are $\frac{7}{8}''$ diameter and $2\frac{13}{16}''$ length.

Bushings are rolled bronze $1\frac{1}{4}''$ long by .935" outside diameter.

Camshaft

Camshafts are forgings of high carbon steel drilled from end to end to provide an oil passage. They are driven by chain from camshaft.

Eccentric for driving fuel pump is on distributor shaft. Distributor drive gear is a separate unit on end of the camshaft and can be replaced without installing a new camshaft.

Cams are of special contour to provide quiet operation and so designed that roller tappets are raised and lowered before final lift takes place.

The cam lift is $\frac{11}{32}''$.

V-12 camshaft weighs $12\frac{5}{8}$ pounds and has four bearings.

V-16 camshaft weighs $16\frac{3}{8}$ pounds and has five bearings.

V-12 Camshaft Bearings

No. 1 2" dia. x 3" long
No. 2 $2\frac{1}{8}''$ dia. x $1\frac{3}{8}''$ long
No. 3 $2\frac{1}{8}''$ dia. x $1\frac{3}{8}''$ long
No. 4 $2\frac{1}{8}''$ dia. x $2\frac{15}{16}''$ long

Thrust is taken on No. 1 bearing.

V-16 Camshaft Bearings

No. 1 2" dia. x 3" long
No. 2 $2\frac{1}{8}''$ dia. x $1\frac{3}{8}''$ long
No. 3 $2\frac{1}{8}''$ dia. x $1\frac{3}{8}''$ long
No. 4 $2\frac{1}{8}''$ dia. x $1\frac{3}{8}''$ long
No. 5 $2\frac{1}{8}''$ dia. x $2\frac{15}{16}''$ long

Thrust is taken on No. 1 bearing.

An important improvement has been made in the camshaft in the 1933 V-16. Because of the high speeds at which these cars are driven, the cam contour has been changed to provide against any possible valve spring vibration, and to give even smoother performance with the wide-open throttle.

Valves *(Obj. 48, 52, 94, 95, 96)*

In V-12 and V-16 engines overhead valves are used for greater *compactness* and power, also greater accessibility for service maintenance. The popular objection to overhead valve noise is overcome by the use of automatic valve silencers.

The valves are operated by a rocker arm driven from the camshaft by a push rod. The rocker arm is mounted on an eccentric bushing that has a small arm against which there is constant pressure from a spring loaded plunger operating in oil. This pressure against the eccentric automatically maintains zero valve clearance, thereby eliminating any noise.

Intake valves are made of tungsten steel and Exhaust valves of silichrome steel. They are $1\frac{23}{64}''$ diameter, with 45° angle seats.

V-12 has 24 valves and V-16 has 32 valves. The valve lift is $\frac{11}{32}''$. Valve guides are removable and the length of valves from top of seat to end of valve stem is $6\frac{9}{64}''$.

Double valve springs are used to prevent clatter even at highest speeds and are retained on valve stem by a split tapered bushing instead of by pin only *(as on some competitive cars)* which is liable to shear off.

Valve spring pressure, with valve open, is 167 pounds, with valve closed, 70 pounds.

The whole valve system operates in a bath of constantly filtered oil, fed to it under pressure. It is simple, fool proof, quiet and needs no attention.

Cylinder Heads

Cylinder heads are detachable and carry the valves and rocker arms. Combustion chambers are machined over their entire surface to enable accurate control of compression pressure and give uniformity of combustion charactertistics.

Compression Ratio

Compression ratio has been increased to 5.6 to 1 on V-12 and 5.7 to 1 on V-16. This change provides increased acceleration, higher top speed and higher gas mileage. Two kinds of gaskets of different thickness make it possible to have lower compression to meet the varying needs of anti-knock fuels, and different altitude conditions that require different compression ratios.

Crankcase Ventilation *(Obj. 44)*

One of the most significant developments pioneered by Cadillac in 1925 was crankcase ventilation. In some cars only breather systems are still used, but Cadillac uses a positive air ventilation system, which eliminates the dilution of the engine oil from unburned fuel vapors and moisture in the crankcase.

In V-12 and V-16 engines the air inlet is thermostatically controlled to regulate the intake of air. The thermostat opens the inlet for cold-weather driving, and closes it for warm-weather driving when engine temperatures are higher and oil dilution is not present.

The air inlet is also fitted with an air cleaner to prevent dust from being drawn into the crankcase.

Crankcase ventilation as used by Cadillac is just another point of the outstanding engineering attention paid to those things which produce satisfactory operation of the car and protect the fine precision of the engine parts. It also reduces oil expense by making oil changes necessary only at 2,000 mile periods or one-half to one-quarter as frequently as is necessary in many other cars.

The system is simple, has no moving parts and requires no attention. Crankshaft compensators act as an air pump and build up a pressure within the crankcase which forces the vapors into the valve compartment.

Outlets in the front of each valve compartment discharge the vapors beneath the car.

Engine Lubrication

Pressure lubrication is supplied to all vital engine parts. This complete and positive lubrication is one of the reasons for the durability and long life of Cadillac engines under the most strenuous use.

An oil pump in the bottom of the crankcase is driven by a gear from the rear end of the camshaft, which forces oil under pressure to all main crankshaft bearings through a main oil pipe. From the main bearings the oil passes to the connecting rod bearings through metered holes in the crankshaft throws and thence through rifle drilled passages in each connecting rod to the piston pins.

Pistons and cylinder walls are lubricated through oil released under pressure from between the crank cheek and connecting rod bearings. Camshaft bearings are lubricated through a drilled passage in the camshaft, fed by oil from the rear camshaft bearing.

The overhead valve gear mechanism is lubricated by a special oil line that is fed direct from the oil filter to the main rocker arm shaft, where it is forced through metered holes to the valve gear to lubricate rocker arm valve stem and automatic silencer.

The timing chain is lubricated from overflow from the regulator valve, located in the timing case at the front of the engine.

To insure the constant filtering of oil, it passes through the oil filter located at the rear of the engine, which removes all grit before it is forced to the valve gear. A fine mesh screen that completely covers the oil pan also filters oil that returns by gravity before it passes through the oil pump to be recirculated.

A float oil level gauge on the outside of the crankcase indicates the positive amount of oil in the reservoir and a pressure gauge on the instrument panel indicates the oil pressure when engine is being operated.

The crankcase is drained by removing an oil plug in the bottom of the case. The V-16 has an alumi-

num oil reservoir with cooling ribs on the outside to assist in quick dissipation of the heat and it holds 10 quarts.

The V-12 oil reservoir is pressed steel and has a capacity of 9 quarts.

Timing Chain

One chain, driven from the crankshaft, drives the camshaft and generator as separate units. An idler gear with an automatic spring tension adjustment takes up any chain wear. Water pump has positive drive from the engine through the chain driven generator shaft.

Manifolds

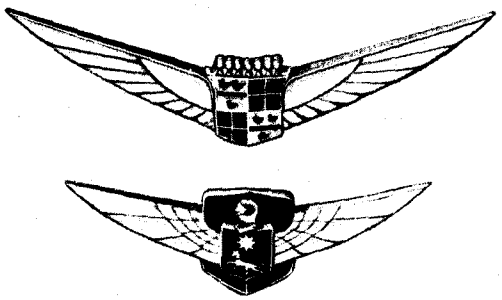
The two inlet manifolds are made of cast aluminum with three ports having a diameter of $1\frac{5}{16}''$.

The two exhaust manifolds with six ports are made of cast iron with baked porcelain finish and have an expansion joint to prevent warpage.

1933

PRELIMINARY
SERVICE INFORMATION

CADILLAC 355-C, 370-C, 452-C
LA SALLE 345-C



Service Department
CADILLAC MOTOR CAR COMPANY
DETROIT, MICHIGAN

CONTENTS

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Preliminary Service Information

Axles

Front Axle

The front axles used on the "C" series cars are of the same construction as the corresponding "B" series axles. The steering connections on the front axle also remain unchanged. The same parts, therefore, are interchangeable on "B" and "C" series cars except the brake support assembly on the 452-C, which is the same as the 370-C assembly.

Since there is no change in the axle specifications, all service operations are the same as on the previous units.

Rear Axle

The rear axle is of the same construction as the "B" series axle except that an oil retainer is used in front of the large pinion bearing as shown in Fig. 1. Likewise, the gear ratios of the new axles remain the same as in the "B" cars.

The oil retainer is installed between the torque tube and the differential carrier to prevent the rear axle lubricant from leaking into the torque tube and eventually into the transmission, in localities where steep grades are common.

The service operations on the rear axle and the interchangeability of parts between the various models remain the same as on the "B" series cars.

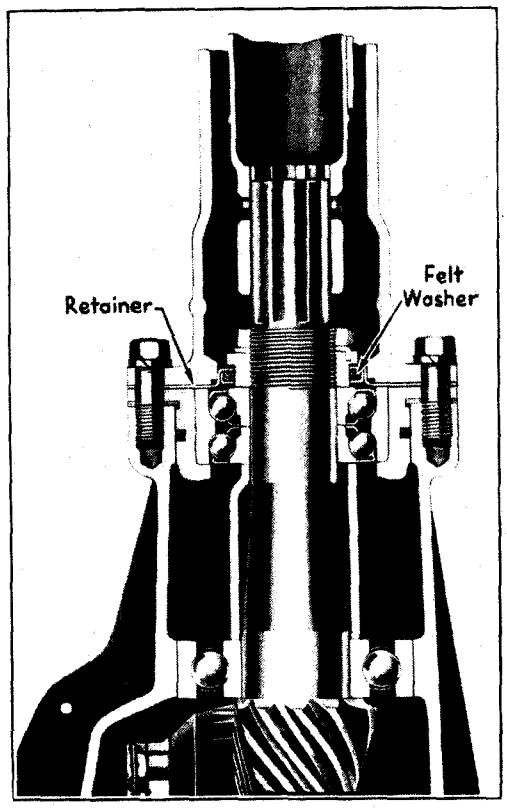


Fig. 1. Oil retainer on rear axle pinion shaft

Body

The bodies on the new models are of the same general construction as on the "B" series. A number of new features, however, have been added, which will be of special interest to service men.

The garnish mouldings are of the same type used on the "B" cars but the method of retaining them in place has been changed slightly in that the invisible fastenings have been eliminated at the sides and top.

Fig. 2. Interior view of front compartment showing controls for door No-Draft ventilators

Visible screws are now used at these points for holding the garnish mouldings in position.

The trigger type lock is retained at the lower side of the garnish mouldings on all door windows while a bayonet lock is used at the rear quarter windows.

The garnish moulding panels are separate from the garnish mouldings on the new Cadillac bodies. These panels are held in place by bayonet locks such as used on the garnish mouldings. To remove these panels it is necessary first to remove the garnish mouldings and then lift the panels up out of position.

The most striking change in the new bodies is the No-Draft ventilating system. This includes pivoting glass panels in the front door and rear quarter windows on all 5 and 7-passenger sedans and the rear doors on Town sedans and Town cars, and the cowl ventilator (Fig. 3) which is baffled and drained in such a way as to be completely rain-proof.

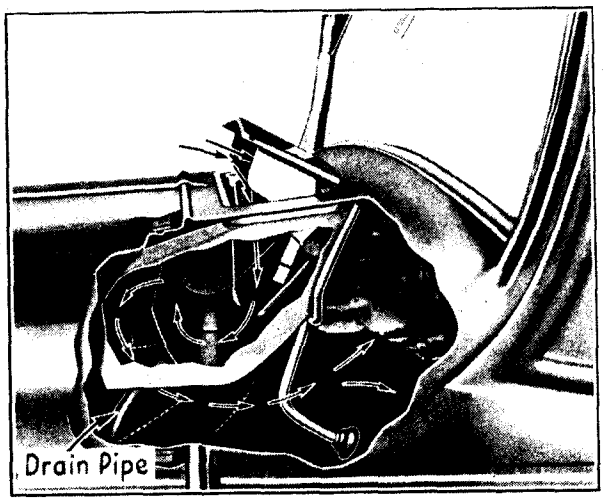


Fig. 3. Shroud cut away to show construction of rain-proof cowl ventilator. Arrows indicate direction of air through ventilator into car body

In Fig. 4 is illustrated the circulation of air in the body. The arrows indicate the approximate passage of air through each ventilating panel. With only one ventilating panel open the air circulates only in the area close to that ventilator. Thus ventilation to suit the individual desire can be readily accomplished. When the ventilating panels are opened slightly, they provide circulation of air within the car but without direct draft on the driver or other passengers. The ventilating panels can also be opened to a position where they will deflect a breeze directly into the car.

The ventilating panels in the door windows (Fig 5). are controlled by a handle conveniently located in front end of the garnish moulding panel as shown in Fig. 2. The rear quarter windows (Fig. 6) are now stationary and the control for the ventilating panel is located just below the window ledge corresponding to the position of the window control on the "B" models. All window ventilator controls are worm-geared for easy operation.

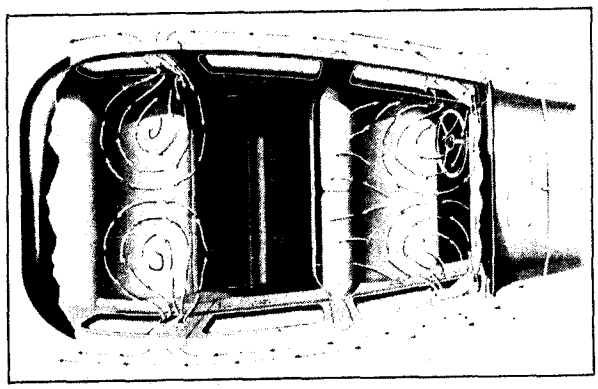


Fig. 4. Cut-away view of car body illustrating circulation of air with No-Draft ventilating system

To open the ventilating panel in the front doors, it is first necessary to lower the window glass far enough to disengage the two sections from each other and permit the ventilating panel to turn. The window glass can then be raised or lowered as desired.

In order to remove the front door windows or the No-Draft ventilators, it is first necessary to remove the garnish moulding, the garnish moulding panel (Cadillac cars), the control handles and the trim panel. Then to remove the ventilator proceed as follows:

1. Remove the narrow wooden strip on top of the lock board.

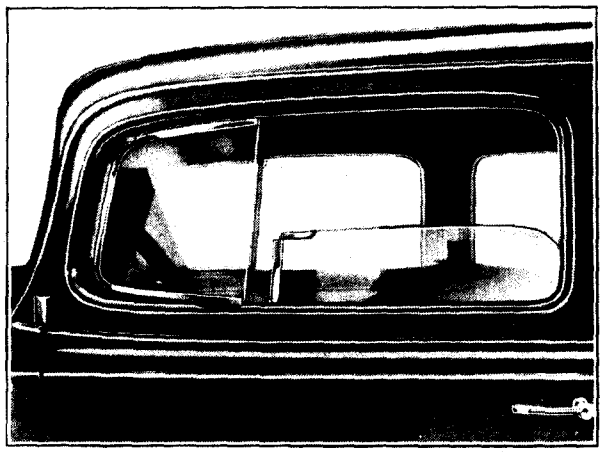


Fig. 5. View of front door window with the No-Draft ventilating panel partly open

2. Remove the screws from the gear box mechanism.
3. Remove the nail from the rear end of the rubber channel.
4. Remove the glass and channel.

In case it is necessary to replace the ventilator glass, the new glass can be installed in the channel simply by pushing it in place, making sure that the channel rubber is in the proper position.

Then to remove the window glass proceed as follows:

1. Remove the two screws which hold the regulator to the lower glass channel.
2. Move the regulator mechanism to one side and lift up on the glass, pushing the top edge forward.

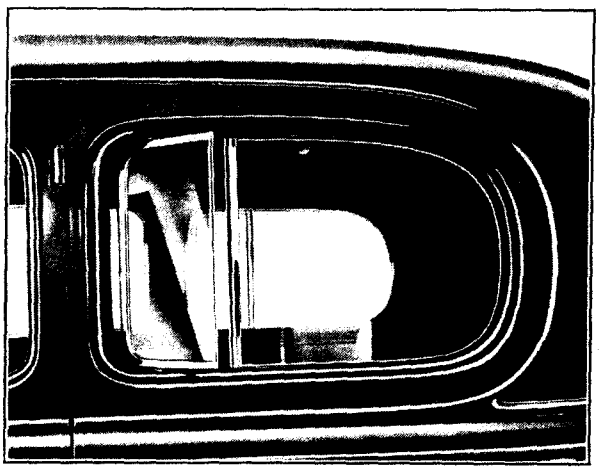


Fig. 6. Rear quarter window with the No-Draft ventilating panel partly open

The No-Draft ventilator can be removed from the rear quarter window as follows:

1. Remove the garnish moulding.
2. Remove the trim at the top edge.
3. Remove the small trim stick and loosen the screws in the bottom bracket of the gear box.

Among the other features of the new bodies are the rubber dams installed at the tops of all doors on the closed bodies. See Fig. 7. The purpose of these dams is to give added protection against wind and rain.

The windshield construction differs from that on previous models, in that it is stationary and cannot be opened. To remove the windshield it is only necessary to remove the garnish moulding, the visors, the header-board and the windshield wiper assembly.

Fig. 7. Rubber dam at top of doors gives added protection against wind and rain

The windshield wiper assembly on closed bodies is the same as on the "B" models except that the motor unit is concealed under the header-board. The wiper assemblies used on convertible coupes and open cars are of a different construction.

The removal of the windshield wiper motor on closed bodies necessitates the removal of the header-board which is done in the same manner as on the "B" cars.

BODY STYLES AND JOB NUMBERS

Fisher and Fleetwood Bodies

When ordering chassis parts affected by wheelbase, the *Body Job Number* must be given the same as when ordering body parts.

Body Type	Job Number	Wheelbase
345-C (LaSalle)		
Fisher Bodies		
2-Pass. Coupe	33-678	130″
2-Pass. Convertible Coupe	33-668	130″
5-Pass. Town Coupe	33-672	130″
5-Pass. Sedan	33-659	130″
5-Pass. Town Sedan	33-652	136″
7-Pass. Sedan	33-662	136″
7-Pass. Imperial Sedan	33-663	136″
355-C (Cadillac)		
Fisher Bodies		
2-Pass. Roadster	33-8-155	134″
2-Pass. Coupe	33-8-178	134″
2-Pass. Convertible Coupe	33-8-168	134″
5-Pass. Phaeton	33-8-256	140″
5-Pass. All-Weather Phaeton	33-8-273	140″
5-Pass. Coupe	33-8-272	140″
5-Pass. Sedan	33-8-259	140″
5-Pass. Town Sedan	33-8-252	140″
7-Pass. Sedan	33-8-262	140″
7-Pass. Imperial Sedan	33-8-263	140″
Fleetwood Bodies		
5-Pass. Sedan	33-8-209	140″
5-Pass. Town Car with Opera Seats—leather back	33-8-225	140″
7-Pass. Sedan	33-8-212	140″
7-Pass. Imperial Sedan	33-8-213	140″
7-Pass. Town Car—leather back	33-8-227	140″
7-Pass. Town Car—metal back	33-8-226	140″
370-C (Cadillac)		
Fisher Bodies		
2-Pass. Roadster	33-12-155	134″
2-Pass. Coupe	33-12-178	134″
2-Pass. Convertible Coupe	33-12-168	134″

Body Type	Job Number	Wheelbase
Fisher Bodies—Continued		
5-Pass. Phaeton	33-12-256	140″
5-Pass. All-Weather Phaeton	33-12-273	140″
5-Pass. Coupe	33-12-272	140″
5-Pass. Sedan	33-12-259	140″
5-Pass. Town Sedan	33-12-252	140″
7-Pass. Sedan	33-12-262	140″
7-Pass. Imperial Sedan	33-12-263	140″
Fleetwood Bodies		
5-Pass. Sedan	33-12-209	140″
5-Pass. Town Car with Opera Seats—leather back	33-12-225	140″
7-Pass. Sedan	33-12-212	140″
7-Pass. Imperial Sedan	33-12-213	140″
7-Pass. Town Car—leather back	33-12-227	140″
7-Pass. Town Car—metal back	33-12-226	140″
452-C (Cadillac)		
Fisher Bodies		
2-Pass. Roadster	33-16-155	143″
2-Pass. Coupe	33-16-178	143″
2-Pass. Convertible Coupe	33-16-168	143″
5-Pass. Phaeton	33-16-256	149″
5-Pass. All-Weather Phaeton	33-16-273	149″
Fleetwood Bodies		
5-Pass. Sedan	33-16-209	149″
5-Pass. Town Car with Opera Seats—leather back	33-16-225	149″
7-Pass. Sedan	33-16-212	149″
7-Pass. Imperial Sedan	33-16-213	149″
7-Pass. Town Car—leather back	33-16-227	149″
7-Pass. Town Car—metal back	33-16-226	149″

Brakes

The new brakes are the same as on the corresponding "B" series cars with the exception that a brake assister has been installed in the LaSalle 345-C and Cadillac 355-C braking systems. See Fig. 8. Although similar in principle to the assister used on the V-12 and V-16 cars, it differs in construction and operation. Because of a difference in the length of the operating tube, the 345-C assister unit is not interchangeable with that used on the 355-C.

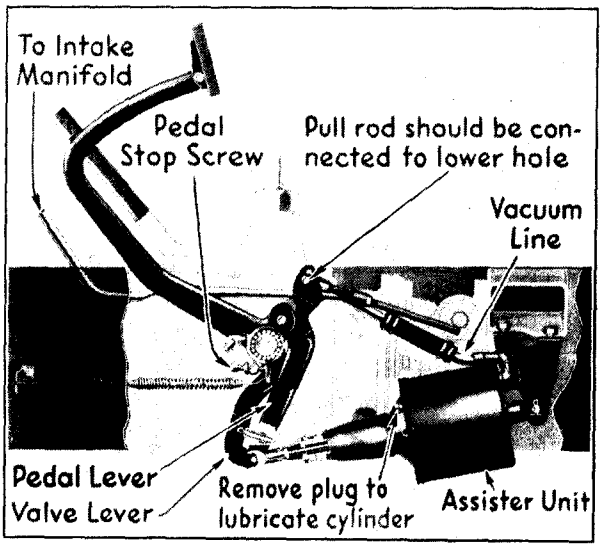


Fig. 8. Brake assister connections on the Cadillac V-8 and La Salle

With the addition of the brake assister, the foot pedal travel has been shortened by relocating the two holes in the pedal arm to which the brake pull rod is connected, making the pedal interchangeable on all four model cars. While this change in the location of the pedal arm holes results in less mechanical leverage for applying the brakes, easier and more efficient braking is secured than heretofore by the aid of the brake assister. With this pedal arrangement, more cam travel is secured; consequently less frequent brake adjustment is required.

As with the Cadillac V-12 and V-16 brakes, the assister on the V-8 cars does not affect the adjustment of the brakes or of the brake connections up to the pedal.

Aside from the brake assister on the 345-C and 355-C cars, all adjustments of the brakes and brake connections remain the same as in the "B" cars. Likewise the brake assister adjustments remain the same on the 370-C and 452-C as on the earlier 370 and 452 models.

A coil spring surrounds each drum on all cars to give additional cooling surface and to absorb any noise produced by vibrations in the drum. See Fig. 9.

The same brake lining is used as on the "B" models.

Brake Assister (345-C, 355-C)

Although the assister on the 345-C and 355-C operates on the same principle as that on the other models, the differences in construction require a detailed explanation.

The brake assister connections on the 345-C and 355-C cars are the same as on the V-12 and V-16 cars. That is, the assister is connected to the intake manifold which furnishes the necessary vacuum. The force thus developed is applied to a lever on the pedal shaft and is added to the force applied by the driver to the pedal. Although the assister is connected to the brake pedal it does not interfere with the pedal action and the foot brakes can be applied whether the engine is running or not.

The control is positive, the valve being regulated by the movement of the brake pedal. The assister

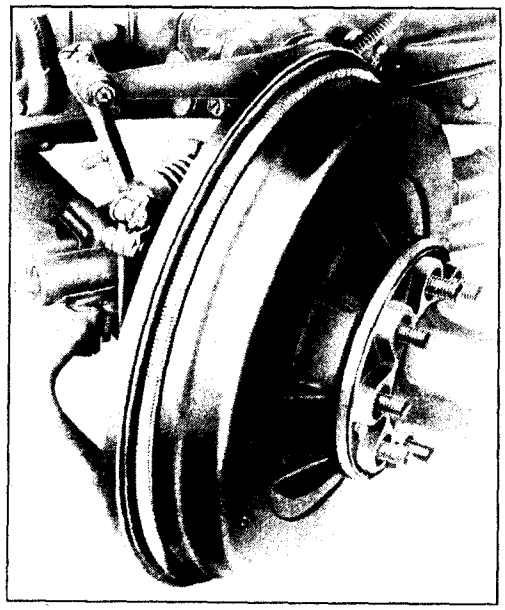


Fig. 9. Brake drum spring

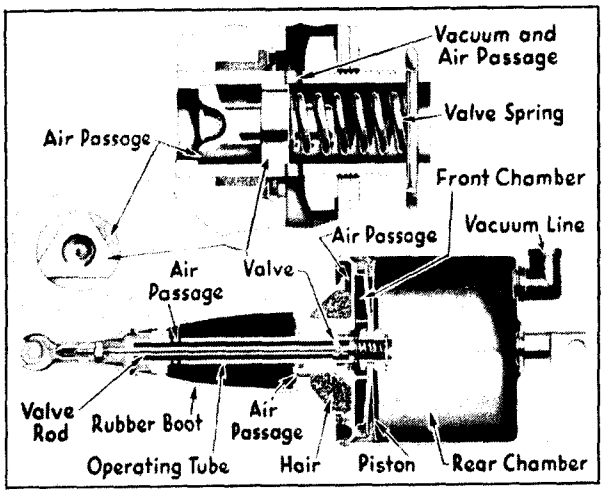


Fig. 10. Sectional views of brake assister used on 345-C and 355-C cars

develops power only as long as the driver continues to push on the pedal. As soon as the driver stops pushing on the pedal, the assister ceases to build up additional force and merely holds the position which has been reached. The assister releases automatically when the driver releases his foot from the pedal.

The relative position of the brake assister parts is shown in Fig. 10. The piston divides the housing into two chambers; the front or atmospheric chamber which is open to the rear chamber when the brakes are not in operation, and the rear or vacuum chamber which is connected to the intake manifold vacuum line. The assister operating tube carries an inner rod which operates the vacuum and atmospheric valve located in the rear end of the operating tube. The operating tube, of course, also connects the piston mechanism to the pedal lever.

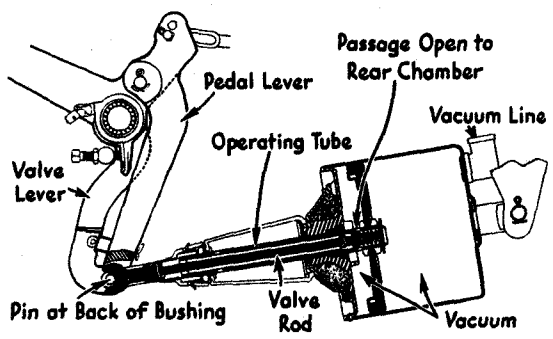


Fig. 11. Brake assister in normal released position. The vacuum and atmospheric valve is all the way forward uncovering the passage in the operating tube and opening the front chamber to the intake vacuum line through the rear chamber

The vacuum and atmospheric valve is of the piston type and controls the vacuum passage between the two chambers in the cylinder and the passage between the front chamber and the atmosphere outside of the cylinder. The valve is held in the closed position by means of a spring as shown in Fig. 10. When the valve is moved part of the way back toward the rear it closes the vacuum passage between the two chambers in the cylinder, and when moved all the way back, the valve keeps the vacuum passage closed and opens the front chamber to the atmosphere. The air entering the cylinder passes through a chamber filled with hair (Fig. 10) which serves as an air cleaner to exclude dust and dirt.

The construction of the pedal lever assembly is the same as that used on the V-12 and V-16 cars and the adjustments are made in identically the same manner.

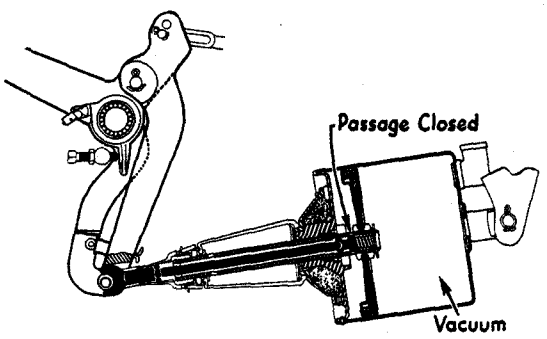


Fig. 12. The brake pedal has been depressed sufficiently to move the valve back far enough to close the passage between the front and rear chambers. The assister cannot function even though the passage between the two cylinders is closed as the front chamber is not yet open to the atmosphere

Assister Operation: The various steps in the operation of the vacuum brake assister are shown in Figs. 11 to 16 inclusive.

In Fig. 11, the brakes are in the released position. It will be seen that the valve rod and valve are all the way forward with relation to the piston. With the valve in this closed position, the passage between the two cylinder chambers is open and the atmospheric passage is closed. Both chambers are now connected to the intake manifold and the vacuum on both sides of the piston is equal.

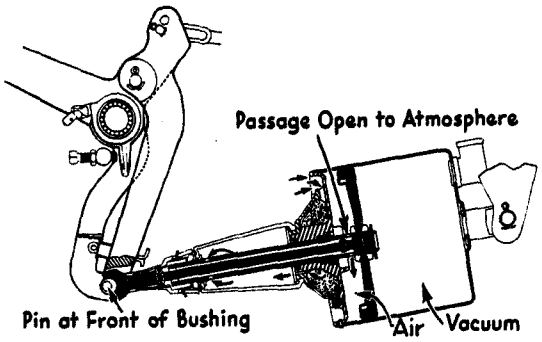


Fig. 13. Further pedal movement has moved the valve back far enough to uncover again the passage in the operating tube keeping closed the passage between the two chambers, and thus opening the front chamber to the atmosphere

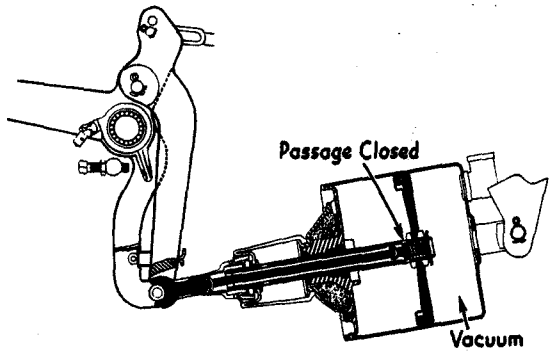


Fig. 15. The pedal movement has ceased, allowing the valve to close the atmospheric passage automatically. As the air in the front chamber cannot escape, it prevents the piston from moving forward and keeps the piston in the position just reached

The pedal in Fig. 12 has been depressed only enough to push the valve rod and valve back to a point closing the vacuum passage between the two cylinder chambers. A slight additional pedal movement has pushed the valve rod and valve back the rest of the way in Fig. 13, admitting air into the front chamber. Atmospheric pressure then forces the piston back as long as the pedal movement continues.

In Fig. 14, atmospheric pressure on the front side of the piston is forcing the piston back as indicated by the arrow to assist the pedal in making application of the brakes. The pedal is still moving downward, keeping the atmospheric passage open.

In Fig. 15 the operator has applied the desired braking force and the pedal movement has ceased, allowing the valve to close the vacuum and atmospheric passages automatically. With the vacuum and atmospheric passages closed, the assister ceases to build up any additional force while the air already in the assister helps to hold the piston and pedal in place. Any additional pedal movement forward will push the valve rod and valve back, opening the atmospheric passage and in turn forcing the piston back to apply the brakes still further.

In Fig. 16 the operator has removed his foot from the pedal, allowing the valve rod and valve to be moved all the way forward by the action of the valve spring. This forward motion of the valve has opened the vacuum passage between the two cylinder chambers, equalizing the vacuum on both sides of the piston and allowing the brake retracting springs to pull the pedal back and the piston forward to their normal released position.

Adjustments: The brake assister and pedal adjustments are made in the same manner as the assister adjustments on the 370-B and 452-B cars. The

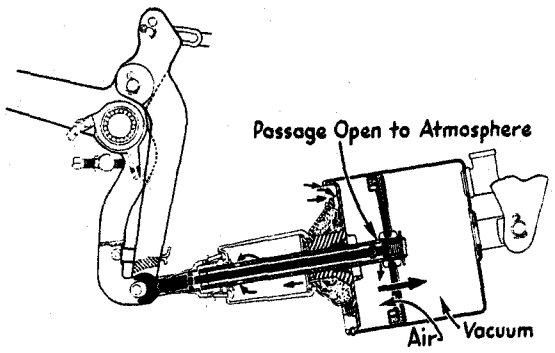


Fig. 14. Atmospheric pressure in the front chamber is forcing the piston back as indicated by the large arrow. The pedal is still moving downward so as to keep the valve back, leaving the atmospheric passage open

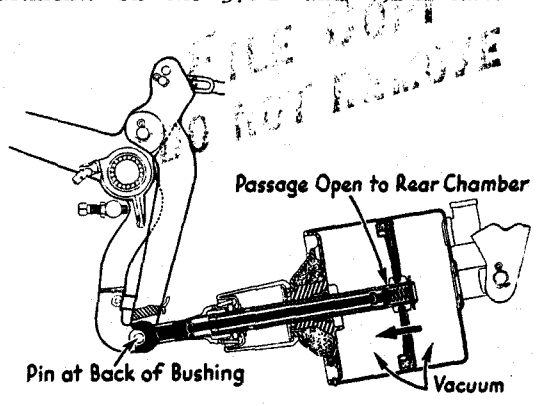


Fig. 16. The pedal has been released, permitting the valve to return to its forward position opening the passage between the two chambers. This equalizes the vacuum pressure on both sides of the piston allowing the piston and pedal to return to their normal released positions

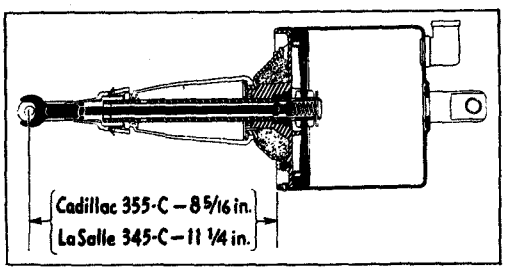


Fig. 17 . Operating tube clevis adjustment for Cadillac V-8 and La Salle brake assister

operating tube clevis adjustment, however, is made to a different dimension as shown in Fig. 17. This adjustment is necessary to provide a slight amount of clearance between the piston and the cylinder head at the front end of the cylinder when the brakes are released and the piston is in the forward position. The piston has this clearance only when the assister is connected in the brake system and the clearance varies slightly depending on the exact setting of the brake pedal lever.

The vacuum and atmospheric valve should have 1/4 inch travel. This can be checked by measuring the amount of travel at the lower end of the valve lever.

The dimension for making the operating tube adjustment with the tube connected to the pedal as shown in the "B" series shop manual should be disregarded on all models. This adjustment is unnecessary when the pedal stop and the assister operating tube adjustments are correctly made. All other brake adjustments remain the same as in the corresponding previous models.

Lubrication: The brake assister on the V-8 cars requires the same lubrication as the clutch power cylinder on the "B" models. That is, one ounce of light machine oil (*not* engine oil) should be injected in the front chamber of the cylinder through the plugged opening in the cylinder head every 6000 miles. The brake assister on the 370-C and 452-C requires the same lubrication as on the 370-B and 452-B cars.

No attempt should be made to disassemble the assister used on the 345-C and 355-C. In the event that the assister unit cannot be made to function satisfactorily it should be returned to the factory on an exchange basis.

Clutch

The clutch used on the new cars is of the same construction as the "B" clutch and all clutches are fully interchangeable with those of the corresponding "B" models.

The clutch release rod and pedal stop adjustments are made in the same manner as on the "B" cars.

Controlled free-wheeling has been discontinued on the new cars.

Cooling System

The cooling system is essentially the same as on the corresponding "B" series cars; however, several minor changes have been made.

The radiator core is of a new "louver-center" fin construction as shown in Fig. 18 which results in 5% greater cooling efficiency due to the air being deflected around the cooling fins instead of passing straight through the core as in the conventional type radiator.

The V-16 water pump has also been improved to give longer life. It is provided with a floating bushing and *two* new packings as shown in Fig. 19. The water packing is at the inner end of the floating bushing where it is kept cool by the water. The outer packing is simply to keep the lubricant from running out.

To repack this pump it is necessary to remove the pump from the engine and to disassemble it in order to remove the old packings. When reassembling the pump, care should be taken to register the slot in the bushing with the hole in the pump body for the bushing locating screw. This is important as the screw should enter the slot in the bushing so as not to lock the bushing in place. The washer should also be in position under the head of the locating screw.

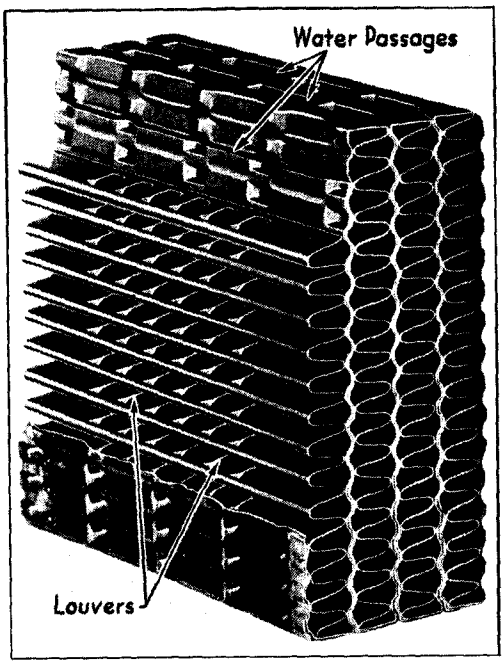


Fig. 18. Section of radiator showing new louvers for deflecting the air through the fins for giving more efficient cooling

The radiator filler cap (Fig. 20) has been placed under the hood on all new cars to aid in giving a streamline appearance to the car and to prevent the spilling of anti-freeze solution and rusty water, on the hood.

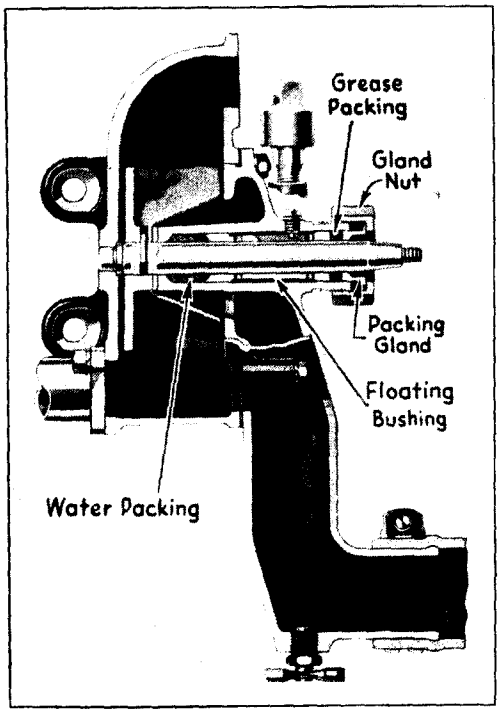


Fig. 19. Sectional view of 452-C water pump

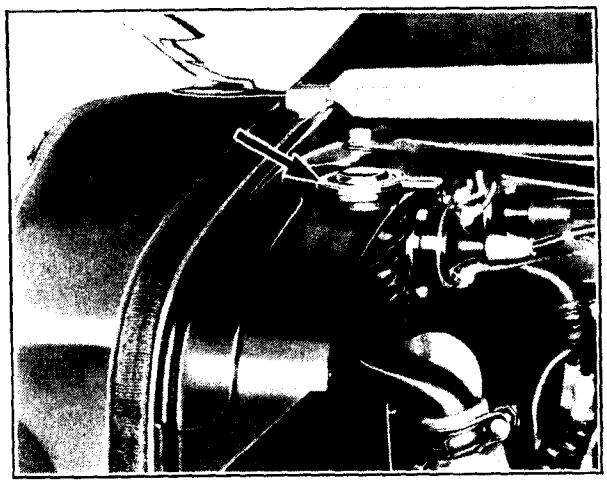


Fig. 20. The radiator filler cap is located under the hood. It is on the left side on the 370-C and 452-C and on the right side on the Cadillac V-8 and La Salle, to correspond to the location of the oil level indicator

The filler opening is on the same side of the engine as the oil level gauge, it being on the right-hand side in the 345-C and 355-C cars and on the left-hand side in the 370-C and 452-C. When filling the radiator, the water level should be brought to a point about 1½ inches below the filler opening.

The construction of the radiator shutter and automatic shutter control is identical with that of the

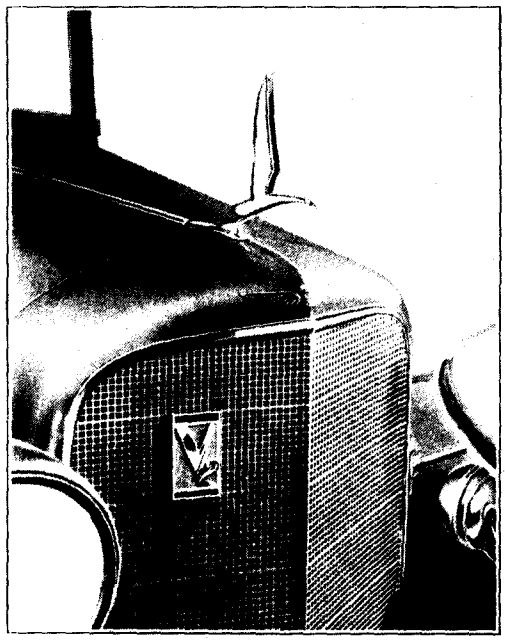


Fig. 21. The new radiator ornaments and medallions are of modernistic design

"B" models and these parts are interchangeable between the corresponding "B" and "C" series.

The radiator casing and grille are of the same construction as on the "B" models but are of the "V" type. The radiator splash shield is also new to conform to the new casing.

The radiator ornament is new as well as the medallions which are of modernistic design. See Fig. 21. New medallions are also used on the wheel hubs, the trunk rack and the steering wheel.

In case it is necessary to remove the radiator ornament, it should be done in the following manner. First remove the rear hood hinge bracket and slide the hood back away from the radiator. Then remove the front hood hinge bracket and unscrew the nuts from the two studs on the ornament after which the ornament can be lifted out of position.

Electrical System

The electrical system remains practically the same on the new models as on the corresponding "B" models. The only changes that have been made in the new series are in the spark plugs and the distributor advance mechanism in the 370-C and 452-C cars.

The spark plugs used on these cars are new. They are of the "G-7" type, especially designed with a pointed porcelain at the electrode end for use in extremely high compression engines. The construction of these plugs differs from that of the "G-7" plugs previously supplied for the "A" series cars where a cooler plug was required. Only the new "G-7" plugs should be used on the 370-C and 452-C as they will meet all the requirements of these engines. Other plugs of the "G" series should not be used.

The advanced mechanism incorporates new advance characteristics to compensate for the higher engine compression ratios used in these cars. The new distributors can be identified by the type numbers 004110 for the 370-C and 004111 for the 452-C.

The method of timing the engine is the same as on the corresponding "B" cars and the contact gap for both the distributor and the spark plugs should be adjusted the same as before.

Engine

The new engines are essentially the same as the "B" series. However, the compression ratios have been increased on the V-12 and V-16 engines as shown in the following chart.

	H.C. (Optional)	H.H.C. (Standard)
370-B	5.1 to 1	5.3 to 1
370-C	5.4 to 1	5.6 to 1
452-B	5.1 to 1	5.4 to 1
452-C	5.4 to 1	5.7 to 1

This increase in compression ratios necessitates a change in the ignition timing and the flywheel marks have been changed accordingly. That is, the I.G.A. marking on the 370-C and 452-C is 4° or approximately ½ in. ahead of center instead of 15° and 10° 15′ respectively.

The compression ratio of the 370-C and 452-C engines can be altered the same as in the "B" models by changing the cylinder head gaskets.

A slight change has been made in the front and intermediate engine supports on the V-8 engines to give a softer mounting. The engine supports are similar in construction to those on the "B" models, but differ somewhat in dimensions as more rubber is used in the cushions.

Exhaust System

The exhaust system is the same and the same parts are interchangeable as on the "B" series cars.

A slight change, however, has been made in the design of the muffler support grommets. It is unnecessary to adjust these grommets as on the "B" models. The nuts can now be drawn up tight without danger of squeezing the rubber.

Fenders and Running Boards

The front and rear fenders are new on all models, both having a skirt at the rear end. The front fenders and head lamps are tied rigidly together at the front end through the radiator casing as shown in Fig. 22. A rear view of the fender tie rod showing how it is attached to the headlamp bracket is presented in Fig. 23.

The fender tie rods must be removed to remove the radiator and casing assembly, simply by disconnecting them from the radiator casing, the headlamp brackets and the fenders. The brace rod in the radiator casing will remain in position.

In order to insure proper alignment of the fender tie rods, when reinstalling the radiator and casing assembly, the tie rods should be attached to the headlamp brackets before they are fastened to the radiator casing. The tie rods can be adjusted to the proper length simply by turning them in or out of the radiator casing bracket.

The running boards are of the same construction as on the "B" series but they are made deeper at the ends to conform to the new fenders.

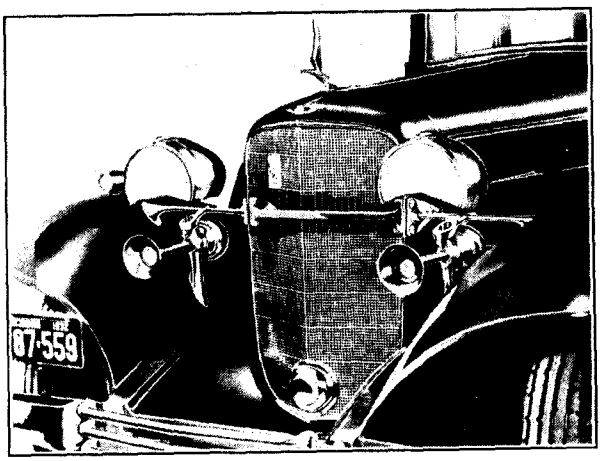


Fig. 22. Radiator grille cut away to show casing brace rod assembly to which the fender tie rods are attached

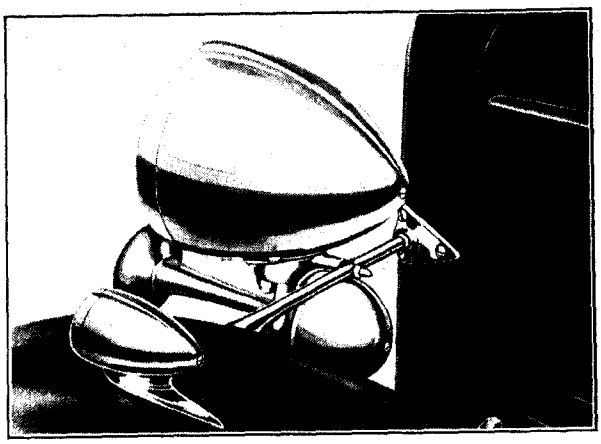


Fig. 23. The fender tie rods not only reinforce the front fenders but also form an additional support for the headlamp brackets

Frame

The series "C" frames are of the same construction as the corresponding "B" models.

Gasoline System

All adjustments and service operations on the gasoline system are made the same as on the "B" series cars.

Lighting System

The lighting system on the new cars is the same as on the "B" series and the aiming of the headlamp is done in the same manner as before. Super-Safe headlamps are used on all models except the LaSalle.

A new type headlamp door is used on the LaSalle. The door and lamp both have a rolled joint for neater appearance. A slight change has also been made in the LaSalle headlamp mounting bracket. It is no longer fastened to the fender at the side but supported at the rear to the fender tie-rod which is attached to the radiator casing.

Lubrication

Lubrication of the series "C" cars is essentially the same as that of the corresponding "B" models with the exception of a couple of points. The clutch power cylinder has been eliminated on all models and the brake assister added on the Cadillac V-8 and LaSalle. Lubrication of the brake assister is covered in the brake section.

Springs and Shock Absorbers

The spring equipment on the new cars is the same as on the "B" models.

The shock absorbers are the same on the new Cadillac cars with the exception of the control valve assembly on the 370-C and 452-C. See Fig. 24. The shock absorbers used on the LaSalle are of slightly different design from those used on the Cadillac cars

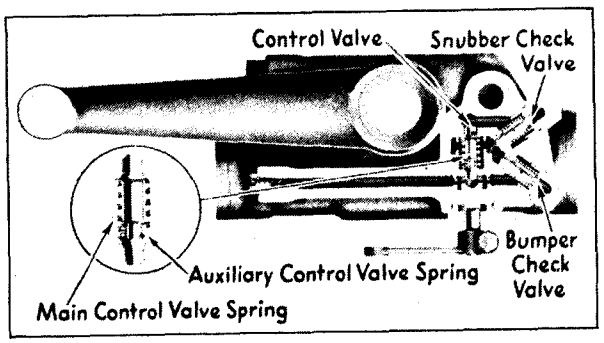


Fig. 24. Sectional view of 370-C and 452-C shock absorber showing the auxiliary spring on the control valve

but they operate on identically the same principle. A sectional view of the LaSalle shock absorber is shown in Fig. 25. The LaSalle shock absorber connections are also new. They are of the rubber type requiring no lubrication.

The new control valve assembly used on the 370-C and 452-C is of the two-stage type. An additional or auxiliary spring has been added to the control valve to give more rigid control in the No. 4 and No. 5 positions of the dash ride regulator. This auxiliary spring is effective only for the last .040 in. of valve travel.

All models have the same control valves. Thus the main spring on the control valve in the 452-C shock absorber is lighter than on the 452-B to give a softer ride in Nos. 1, 2 and 3 positions of the ride regulator.

The shock absorbers can be identified for type and location on the car by the code number stamped on the under side of the control valve operating lever as given in the table on page 15.

The lubrication of the shock absorbers is done in the same manner as on the "B" models.

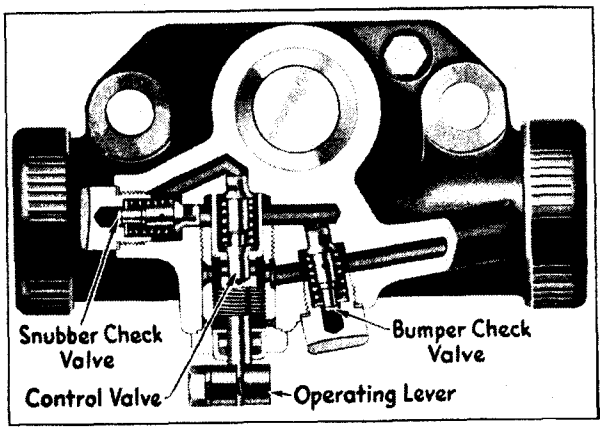


Fig. 25. Sectional view of La Salle 345-C shock absorber

Table of Shock Absorbers and Shock Absorber Valves

Shock Absorber		Control Valve			Bumper Check Valve		Snubber Check Valve	
Location	Part No.	Code on Lever	Identification	Part No.	Identification	Part No.	Identification	Part No.
345-C								
Left Front	1054075	5 E 5	Copper Oxide Finish	047708	5	047678	5	047678
Right Front	1054077	5 E 5	Copper Oxide Finish	047708	5	047678	5	047678
Left Rear	1054081	5 L 5	Nickel Finish	047706	5	047678	5	047678
Right Rear	1054079	5 L 5	Nickel Finish	047706	5	047678	5	047678
355-C								
Left Front	047717	1 C 5	Steel Finish	047707	5	047678	1	047677
Right Front	047718	1 C 5	Steel Finish	047707	5	047678	1	047677
Left Rear	047720	5 G 1	Copper Finish	047704	1	047677	5	047678
Right Rear	047719	5 G 1	Copper Finish	047704	1	047677	5	047678
370-C, 452-C								
Left Front	047717	1 C D 5	Steel Finish	1060149	5	047678	1	047677
Right Front	047718	1 C D 5	Steel Finish	1060149	5	047678	1	047677
Left Rear	047720	5 G D 1	Copper Finish	1060148	1	047677	5	047678
Right Rear	047719	5 G D 1	Copper Finish	1060148	1	047677	5	047678

Steering Gear

No changes have been made in the steering system and the steering gear adjustments are identical with those on the "B" models.

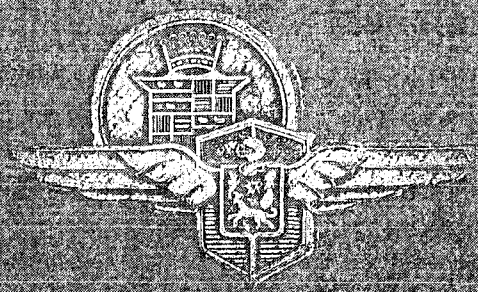
Transmission

The transmission remains unchanged. The service operations and the interchangeability of parts between models are the same as on the "B" series cars.

Wheels, Rims and Tires

These units remain the same as on the "B" models, except the wheel and tire size on the 452-C, and the same service operations apply to both series. The same size wheels and tires are now used on the 452-C as on the 370-C cars.

CADILLAC LA SALLE
SHOP MANUAL



Changes to be made in "B" series Shop Manual

Make the following changes in your copy of the "B series Shop Manual, so that it will contain the latest information. This information does not appear on the revised pages.

Page 11. Differential carrier assemblies (Note 1) are no longer serviced as a unit for V-8 and V-12 "B" and "C" series cars. See "Replacement and Adjustment of Rear Axle Ring Gear and Drive Pinion," page 13A.

Page 19. The sentence "When ordering chassis parts affected by wheelbase, the Body Job Number must be given the same as when ordering body parts" should be crossed out. This information is no longer necessary.

Page 32. The instruction "Lubricate control valve with light machine oil" should be changed to read, "Lubricate with S. A. E. No. 10 oil or light machine oil of weight similar to shock absorber oil."

Page 46. In Fig. 2, the dimension 7/8 in. indicating the distance the timing mark is ahead of the dead center mark on 345-B and 355-B flywheels, should be changed to 1 1/8 in.

The dimensions 1 27/32 in. and 1 1/4 in. for the 370-B and 452-B engines, respectively, applies only to these models. On 370-C and 452-C engines the ignition timing mark is 1/2 in. ahead of the center mark as measured on the circumference of the flywheel.

Page 47. Opposite the subject "Timing mark IG/A ahead of center" the dimension 1 13/16" for the 370-B should be changed to 1 27/32".

Page 53. The piston clearances as given in Note 10 are no longer recommended. New limits have been set up in production and are now recommended for fitting pistons in service for both standard and oversize blocks. For V-8 and V-12 cars (with Electro-plated pistons), use a .0025 in. feeler gauge, with a pull of 6 to 15 pounds pull on the spring scale. With V-16 cars (unplated pistons), use a .003 in. gauge with a pull of 6 to 9 pounds on the scale.

Page 61. Opposite the subject "Width of rings—Lower compression (Two on 452-B)," the dimension 1/8" should be inserted in the 452-B column.

Page 79. The fourth paragraph in the second or right column should be changed to read as follows: "The beam modification for Pennsylvania consists in rendering the 32 candle-power beam in the right headlamp inoperative by the use of a special switch lever at the top of the steering wheel. In the remaining states the beam modification is obtained by disconnecting the right head-lamp wire leading to the 32 candle-power filament in the lamp bulb. Owners of cars thus modified should be cautioned against any attempt to restore to use the filament thus eliminated."

NOTE—A special bulb with a filament arrangement of 21-32-21 candlepower is available from the Factory Parts Division, under Part No. 883874, for use in the Super-Safe lighting system in Pennsylvania. When used in the Super-Safe lamps, these bulbs provide a City Driving Beam by lighting a 32 c.p. filament in each lamp in place of the 21 c.p. filament normally used. This provides a very satisfactory driving light for either city or country driving. The Country Passing Beam utilizes both a 32 c.p. and a 21 c.p. filament in the left lamp and a 21 c.p. filament in the right lamp. The City Passing Beam lights a 21 c.p. filament in each lamp. The Country Driving Beam is, of course, not used. These arrangements all comply with the Pennsylvania law.

Pages 86 and 88. The caption above the top row of illustrations "Clutch Control Cylinder" should read "Clutch Control Valve."

Page 99. The yoke throw from neutral to applied position should be 1/8—5/32" instead of 3/32—5/32".

Page 102. In Fig. 2, the yoke travel should be 1/8—5/32 in.

Page 107. The instructions presented in Note 1 for adjusting the front wheel bearings are now obsolete. See latest recommendations given in Note 4 on page 106B.

Page 109. Opposite the subject "Pressure in Pounds—Normal—Front and Rear" the Number 40 should be changed to 35 for all car models.

The following item should also be included under Tires-Pressure in pounds. "The front tires on all models should be inflated to 40 pounds for continuous high speed driving."

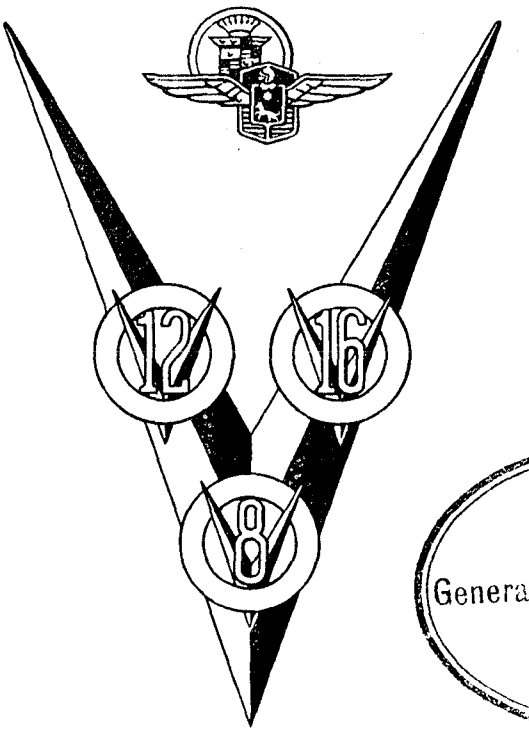
The rim diameter and tire size as given for the 452-B applies also to early 452-C cars.

Later 452-C cars are provided with 17-in. rims and 7.50 x 17-in. tires the same as the 370-C.

CADILLAC - LA SALLE

SHOP MANUAL

CADILLAC 355-B-C, 370-B-C, 452-B-C
LA SALLE 345-B-C



Service Department
CADILLAC MOTOR CAR COMPANY
DETROIT, MICHIGAN

August 1933

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 Cadillac shop experience and does not 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 brief description accompanied by service information in the form of notes. Following this is a specification table giving clearances, dimensions and other facts important to service men. The rest of the information is in picture form.

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

Introduction

Arrangement of Tables

THE subjects covered in the specification tables are listed in alphabetical order in the first column. Under these items will be found important comments, cautions and references to illustrations and notes.

One class of information in the specification tables consists of limits for the clearance between parts subject to wear. The limits given are of two kinds. The "New limits" are those to be observed when installing new parts. The "Worn limits" are those beyond which it is inadvisable to continue to use the worn parts if quietness of operation and maximum performance are to be 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 LaSalle.

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. On Cadillac 355-B and La Salle 345-B cars, this engine number is stamped on the crankcase near the water inlet on the right-hand side. The Cadillac 370-B and 452-B have the engine number stamped on the right-hand side of the crankcase on the generator drive chain housing.

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 when 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.

Contents

NOTE: The information contained in this book is grouped under the headings shown below.

Front Axle

Rear Axle

Body

Brakes

Clutch

Contents

Cooling System

Electrical System

Engine

Exhaust System

Fenders

Frame

Gasoline System

Lighting System

Lubrication

Springs and Shock Absorbers

Steering Gear

Transmission

Wheels, Rims and Tires

Supplementary Introduction

THE information presented in the Cadillac-LaSalle "B" series Shop Manual will in nearly all instances apply to the "C" series cars. There are, however, certain cases where the construction, adjustment or specification of a "C" series unit differs from the corresponding "B" series unit.

In order to make the "B" Shop Manual fully applicable to the "C" series cars as well as the "B" series, supplementary pages have been issued for insertion in the "B" manuals. While these pages are presented primarily to cover the differences in the "C" series cars, they also contain new information on the "B" series as well as the "A" series cars.

The supplementary pages can be identified by the date "August 1933" printed in the lower margin close to the binding edge.

FRONT AXLE

General Description

The front axles used on Cadillac and LaSalle cars are of the reverse Elliot type. They are of the same general construction, but differ slightly in minor details. The 345-B, 355-B and 370-B axles are identical but differ from the 452-B axle in dimensions and the drop of the I-beam. The 452-B steering arms are also slightly longer because of the larger brakes and for this reason the cross rod is shorter than on the other models.

The steering knuckles pivot on adjustable ball bearings at both the top and the bottom. The lower bearing takes the combined thrust and radial load and the upper one takes radial load only. The knuckle bolts and bearings are entirely outside of the brake dust shields. This construction prevents any possibility of grease from the knuckles getting on the brakes.

The front wheels are also carried on ball bearings which are adjustable.

The steering cross-rod joints are of the ball and socket type. The joints are fitted to a definite tightness because friction at this point has an important effect in steadying the front wheels. That is, the point of contact between the pivot and the seats, together with the heavy springs for holding the seats against the pivot, makes it possible to control the friction at the joint so as to absorb road shock without causing hard steering.

The service operations and adjustments of the front axle are the same on all cars.

Service Information

1. Caster Angle

The caster angle on all models is 2½ to 3½°. Wedge plates are to be used when necessary between the front springs and the spring seats on the I-beam to give this caster.

Test the caster with a suitable gauge with the car on a level floor to determine the correct wedge plate to use. Place the thick edge of the plate toward the rear.

The following wedge plates may be secured from the factory Parts Division:

1° Wedge Plate—Part No. 873787
1½° Wedge Plate—Part No. 876813

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.

3. Steering Cross-rod Joint Adjustment

The tightness of the cross-rod joint should be such that a pull of 10 to 18 pounds at the end of a 6-in. wrench is necessary to turn the pivot in the socket. This test is made by disconnecting the pivot from the steering arm, reinstalling the retaining nut on the pivot and turning the pivot with a wrench as shown in Fig. 3, Plate 1. The pivot should be well lubricated when making this test.

If the spring tension is insufficient, it can be adjusted by installing thin shims under the take-up spring.

4. Stop Screw Adjustment

The left-hand stop screw should be adjusted to keep the inner wall of the tire ⅝ to ⅞ in. away from the steering connecting rod.

Prior to steering gear units 11-1256 on the 345-B and 12-1245 on the 355-B and 370-B, a greater clearance may be necessary in order to prevent the sector from bottoming against the housing in the steering gear when turning to the left. The left-hand stop screw should be adjusted so that it comes into play just before the sector bottoms in the housing, making sure that the clearance is not less than that specified above.

The right-hand stop screw should be adjusted to give a clearance of not less than 2¾ in. between the tire and the frame on all cars.

FRONT AXLE

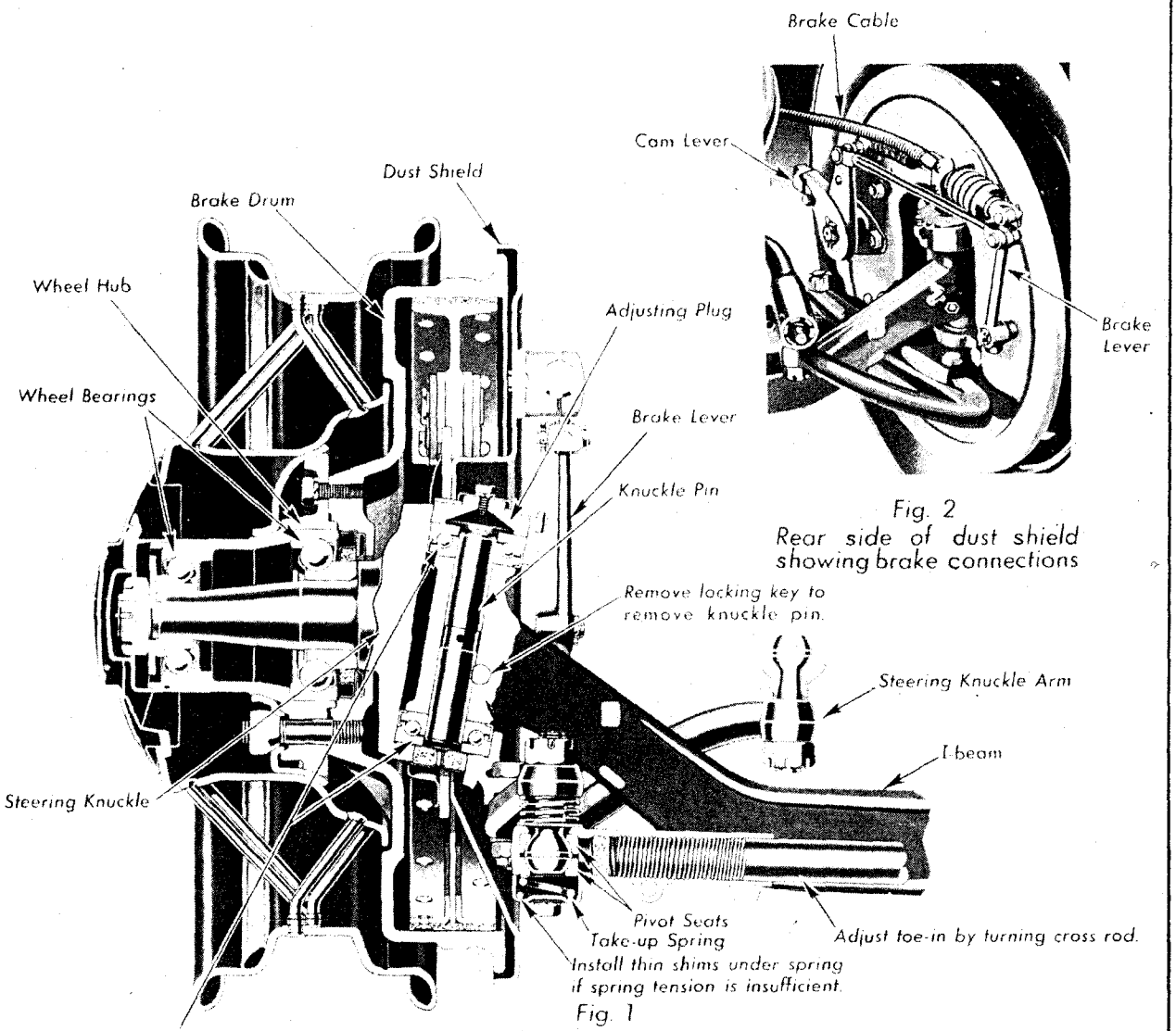


Fig. 2
Rear side of dust shield showing brake connections

Fig. 1
Sectional View of Front Wheel, Hub and Steering Knuckle. Typical of all models.

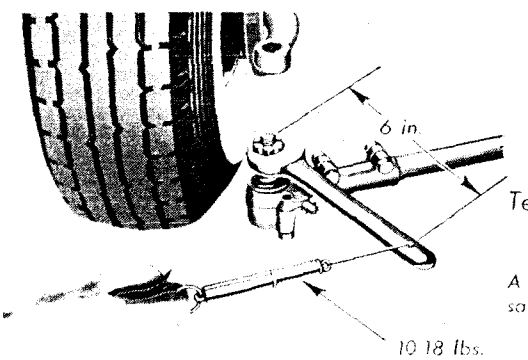


Fig. 3
Testing tightness of steering cross rod joint with spring scale.

A pull of at least 10 pounds should be necessary to turn pivot.

Plate 1. Front Axle Details

FRONT AXLE—Service Information—Specifications

5. Steering Knuckle Bearing Adjustment

The adjustment of the steering knuckle bearings can be checked by lifting the wheel up and down with a bar. In case of looseness, the adjusting plug should be tightened. Use a wrench with a handle 12 to 15 in. long and tighten the adjusting plug as tight as possible by hand. Do not loosen the adjustment except to eliminate binding in the steering.

6. Front Wheel Bearing Adjustment

The procedure to follow in adjusting the front wheel bearings is first to make sure that the wheel is all the way on the spindle. Then tighten the adjusting nut as tight as possible by hand using a wrench with a handle 12 to 15 in. long, after which back off the nut one third turn or two flats. If the locking device cannot be placed in position without changing the adjustment, tighten instead of loosen the adjusting nut until it can be secured with the locking device. It is preferable to have the adjustment on the tight side rather than the loose side provided it is not necessary to tighten the nut more than one half the distance to the next cotter pin slot.

It is also a good plan to turn the wheels toward the right side when adjusting the left wheel bearings and toward the left side when adjusting the right wheel bearings to assure full release of the brakes.

CAUTION: When adjusting the front wheel bearings, care should be taken not to mistake play in the knuckle bolts for play in the wheel bearings.

Specifications

Subject and Remarks	LaSalle	Cadillac		
	345-B	355-B	370-B	452-B
Camber of front wheel (angle with vertical), Fig. 1 Plate 2—				
With car weight on wheels	¾-1°	¾-1°	¾-1°	¾-1°
With car weight off wheels	1½°	1½°	1½°	1½°
Angle between steering knuckle bolt and vertical—				
With car weight on wheels	8¼-8½°	8¼-8½°	8¼-8½°	8¼-8½°
With car weight off wheels	7¾°	7¾°	7¾°	7¾°
Angle between steering knuckle bolt and wheel spindle	99¼°	99¼°	99¼°	99¼°
Caster angle (See Note 1)	2½-3½°	2½-3½°	2½-3½°	2½-3½°
Angle between spring seats and vertical plane of I-beam	90°	90°	90°	90°
I-beam twist—allowable variation between ends (misalignment between steering knuckle bolts) (See Note 2)	½°	½°	½°	½°
Road clearance under front axle	8⅛"	8⅛"	8⅝"	8⅜"
Measure with new tires inflated to 40-45 lbs. and no load in car.				
Steering cross-rod end spring—				
Free length	23/32"	23/32"	23/32"	23/32"
Compression in pounds when compressed to 9/16 in.	200-225	200-225	200-225	200-225
Springs must not show any set when compressed with coils touching.				
Steering cross-rod joint—				
Adjustment (See Note 3), Fig. 1, Plate 1	.....	.....	.....	.....
Pivot balls out of round—worn limit, not over	.010"	.010"	.010"	.010"
Pull necessary to turn pivot in socket (See Fig. 3, Plate 1)	10-18 lbs.	10-18 lbs.	10-18 lbs.	10-18 lbs.
Steering knuckle bearing adjustment (See Note 5)	.....	.....	.....	.....
Stop screw adjustment (clearance between tire and nearest point of possible interference) (See Note 4)	⅝-⅞"	⅝-⅞"	⅝-⅞"	⅝-⅞"
Toe-in of front wheels, Fig. 7, Plate 2	1/16-3/16"	1/16-3/16"	1/16-3/16"	1/16-3/16"
Tread	59⅞"	59⅞"	59⅞"	59⅞"
Type	Reverse Elliot	Reverse Elliot	Reverse Elliot	Reverse Elliot
Unit number location	.....	.....	.....	.....
All models—On top of R. H. spring pad.				
Wheel bearing adjustment (See Note 6)	.....	.....	.....	.....

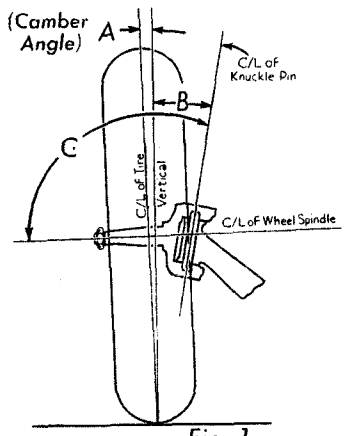


Fig. 1
Elements of Front Wheel Camber.
Check camber with camber gauge on level floor. Adjust height of hubs by altering tire pressure.

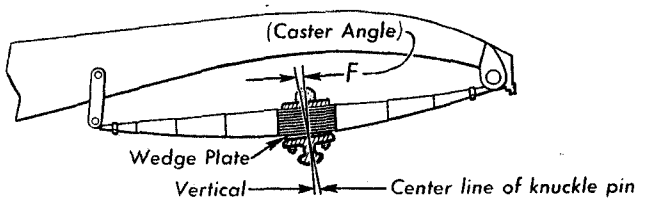


Fig. 3
Front Wheel Caster
Check with caster gauge on level floor. All wheels must be same distance off floor. Caster angle can be changed by inserting wedge plate between I-beam and spring with thick edge toward rear.

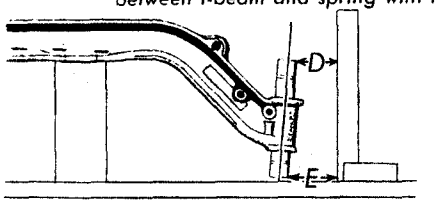


Fig. 2
Checking steering knuckle pin angle

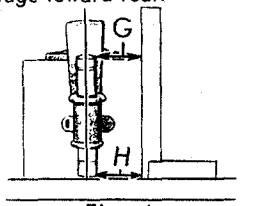


Fig. 4
Checking angle of steering knuckle pin with spring seat

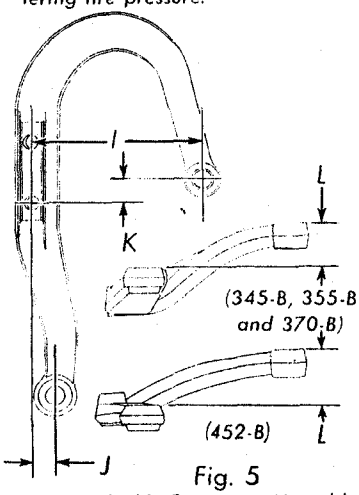


Fig. 5
L. H. Steering Knuckle Arm.

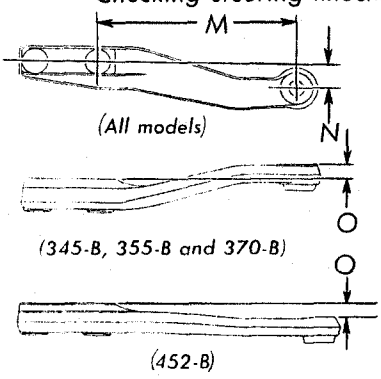


Fig. 6
R. H. Steering Knuckle Arm.

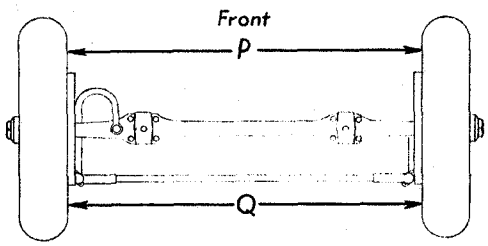


Fig. 7
Front Wheel Alignment (toe-in)
Check with front wheel aligning gauge. Adjust by turning steering cross rod.

Front Axle Specifications

	345-B	355-B (Except 156 in. W.B.)	370-B (Except 156 in. W.B.)	355-B, 370-B (156 in. W.B.)	452-B
A-B-C	See "Camber" under "Specifications," Page 9 for these dimensions				
D-E	"D" should be $\frac{11}{16}$ in. less than "E"				
F	2½-3½°	2½-3½°	2½-3½°	2½-3½°	2½-3½°
G-H	"G" should equal "H"				
I	$6\frac{7}{16}$"	$6\frac{7}{16}$"	$6\frac{7}{16}$"	$6\frac{11}{16}$"	$6\frac{11}{16}$"
J	$\frac{29}{32}$"	$\frac{29}{32}$"	$\frac{29}{32}$"	1⅛"	1⅛"
K	$\frac{29}{32}$"	$\frac{29}{32}$"	$\frac{29}{32}$"	$\frac{29}{32}$"	$\frac{29}{32}$"
L	$1\frac{11}{16}$"	$1\frac{11}{16}$"	$1\frac{11}{16}$"	$2\frac{1}{16}$"	$2\frac{1}{16}$"
M	7½"	7½"	7½"	$8\frac{5}{16}$"	$8\frac{5}{16}$"
N	$\frac{29}{32}$"	$\frac{29}{32}$"	$\frac{29}{32}$"	1⅛"	1⅛"
O	$\frac{11}{16}$"	$\frac{11}{16}$"	$\frac{11}{16}$"	$\frac{15}{32}$"	$\frac{15}{32}$"
P-Q	"P" should be $\frac{1}{16}$—$\frac{3}{16}$ in. less than "Q" measured against tire side wall 8 in. above floor.				

Plate 2. Front Axle Alignment, Camber and Caster

REAR AXLE

General Description

Cadillac and LaSalle rear axles are of the three-quarter floating type. They are similar in construction but differ somewhat in dimensions and in gear ratios.

The construction of the rear axle for the 345-B, 355-B and 370-B cars is identical with the exception of the gear ratio. The 370-B ratios are slightly lower than the corresponding ratios for the 345-B and 355-B.

The 452-B rear axle is of the same design as that of the other models but the gear ratios are different and the axle is somewhat larger to accommodate the heavier car.

The rear axle housing on all models is of the banjo type and carries not only the driving parts but also the rear brake mechanism. It is designed for underslung springs.

The differential is of the two-pinion type with bronze washers to take the thrust of the side gears and the differential pinions.

The differential is carried on tapered roller bearings while ball bearings are used for the driving pinion.

The differential carrier is reinforced by a plate installed between the differential cover and the axle housing and fitting over the cap bolts. This reinforcement adds considerably to the rigidity of the differential carrier.

The driving thrust of the rear axle is transmitted through the torque tube to the ball and socket joint which is attached to the rear end of the transmission.

The axle shafts are keyed to the driving hubs to which the wheels are bolted. This arrangement allows the use of a single annular type ball bearing in each rear wheel to take the load. This construction is typical of the three-quarter floating principle.

Baffle plates are used in the axle housing to keep excessive lubricant from getting into the wheel bearings. Two baffles are used for each shaft, one near each end. There is also a threaded bushing in the outer end of each housing tube which functions as an oil return.

The service operations and adjustments of the rear axle are the same on all models.

Service Information

1. Differential Carrier Installation

Before differential carrier assemblies are shipped by the Parts Division, all lubricant is washed out of the bearings. It is important, therefore, to lubricate the pinion shaft bearings before the assembly is installed, or they are liable to be damaged before the differential lubricant works its way up to them.

Place assembly on end with gears up, and pour about a pint of differential lubricant on the pinion. Leave the assembly in this position until the lubricant has run down through the back bearing and has thoroughly lubricated the front bearing. The assembly is now ready for installation.

After installation, the differential case should, of course, be filled to the proper level.

2. Gear Adjustment

The pinion and ring gear are properly adjusted at the factory, and this adjustment should not be changed. If adjustments or replacements are ever necessary, the entire differential carrier assembly should be replaced and the old one, together with its original shims, sent to the Factory Parts Division for exchange.

Use a Puller (Tool No. HM 109404) when removing the propeller shaft from the pinion shaft. Do not use a hammer in removing the shaft or the pinion shaft may be damaged.

REAR AXLE

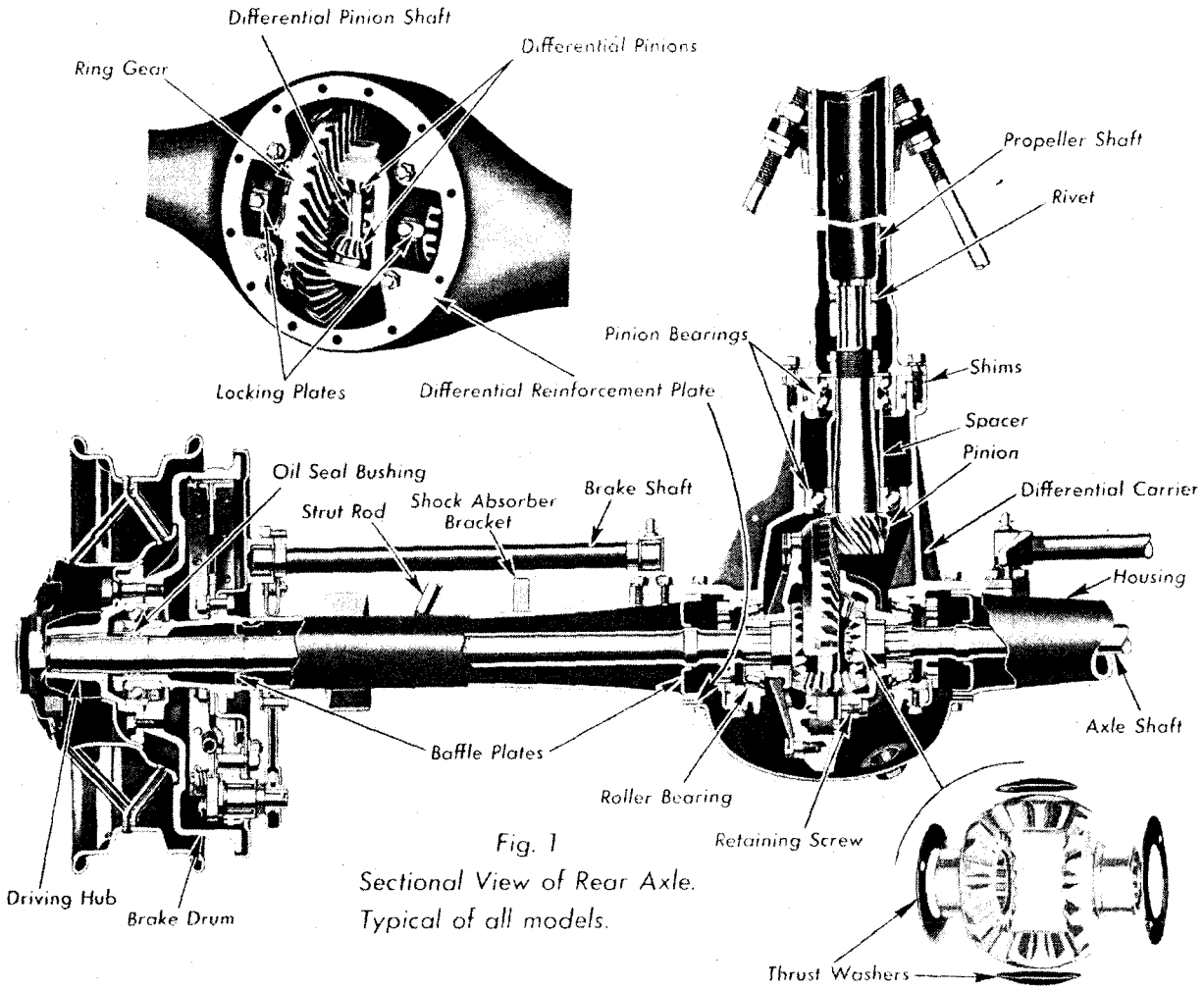
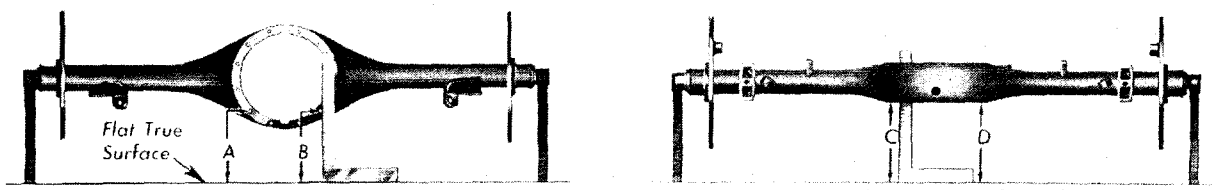


Fig. 1
Sectional View of Rear Axle.
Typical of all models.



"A" and "B" when housing is right side up should equal "A" and "B" when housing is upside down.

"C" should equal "D" when either face of housing is down.

Fig. 2
Rear Axle Housing on V Blocks for Testing

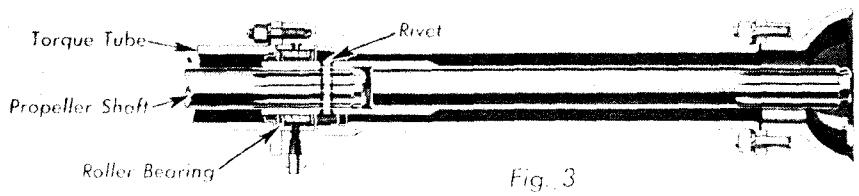


Fig. 3
Sectional View of Torque Tube and Propeller Shaft Extension for 156 in. W.B. Cars—Cadillac 355-B and 370-B.

Plate 3. Rear Axle Details and Alignment

REAR AXLE—Specifications

Subject and Remarks	LaSalle	Cadillac		
	345-B	355-B	370-B	452-B
Axle housing out of true, not over *Use front wheel alignment gauge to check alignment of rear wheels*	$\frac{3}{32}$"	$\frac{3}{32}$"	$\frac{3}{32}$"	$\frac{3}{32}$"
Axle shaft length, left side (overall)	$33\frac{1}{16}$"	$33\frac{1}{16}$"	$33\frac{1}{16}$"	$33\frac{1}{16}$"
Axle shaft length, right side (overall)	$35\frac{11}{16}$"	$35\frac{11}{16}$"	$35\frac{11}{16}$"	$35\frac{11}{16}$"
Axle shaft out of true, not over	$\frac{1}{32}$"	$\frac{1}{32}$"	$\frac{1}{32}$"	$\frac{1}{32}$"
Differential carrier installation (See Note 1)	.....	.....	.....	.....
Gear adjustment or replacement (See Note 2)	.....	.....	.....	.....
Gear ratios—				
High	4.36 : 1	4.36 : 1	4.60 : 1	4.31 : 1
Low	4.60 : 1	4.60 : 1	4.80 : 1	4.64 : 1
Lubrication See Lubrication Section	.....	.....	.....	.....
Propeller shaft length (overall)—				
130-in. wheelbase	$55\frac{27}{32}$"	.....	.....	.....
136-in. wheelbase	$61\frac{27}{32}$"	.....	.....	.....
134-in. wheelbase	.....	$59\frac{3}{32}$"	$54\frac{9}{16}$"	.....
140-in. wheelbase	.....	$65\frac{3}{32}$"	$60\frac{9}{16}$"	.....
143-in. wheelbase	.....	.....	.....	$54\frac{9}{16}$"
149-in. wheelbase	.....	.....	.....	$60\frac{9}{16}$"
Propeller shaft out of true, not over	.010"	.010"	.010"	.010"
Propeller shaft, side clearance between splines and hub of universal joint				
New limits	.001-.005"	.001-.005"	.001-.005"	.001-.005"
Worn limits, not over	.006"	.006"	.006"	.006"
Road clearance (minimum) under rear axle *To be measured with tires inflated to 40 lbs. and no load in car.*	$7\frac{5}{8}$"	$7\frac{5}{8}$"	$8\frac{1}{8}$"	$8\frac{11}{16}$"
Tread	61"	61"	61"	61"
Type of axle	¾ Flt.	¾ Flt.	¾ Flt.	¾ Flt.
Unit number location All models—Rear surface of housing at lower R. H. side	.....	.....	.....	.....

REAR AXLE—Service Information

3. Installation of Pinion Shaft Oil Retainer

Late "C" series cars have an oil retainer on the pinion shaft between the torque tube and the differential carrier to prevent the rear axle lubricant from leaking into the torque tube and eventually into the transmission in localities where steep grades are common. The retainer assembly consists of a double plate spot welded at two points containing a felt washer, and a bearing retaining nut with a spiral oil return groove cut in the outer surface. Cars having this oil retainer can be identified by an inspection of the rear axle as the retainer if used will be plainly visible between the torque tube and the front end of the differential carrier.

This retainer assembly, Part No. 1081881, and bearing retaining nut, Part No. 891890, may be installed on early "C" series and "B" series cars. To install the retainer first remove the rear axle assembly from the car, and then remove the torque tube and propellor shaft from the axle assembly. Remove both bearing retaining nuts, locking washer and thrower washer from the front end of the pinion shaft. Discard the wide retaining nut and oil thrower washer, but save the narrow locking nut and the locking washer.

Place a few drops of oil on the felt washer and install the retainer with the well containing the felt extending toward the front of the car as shown Plate 3-A. Next, install the bearing retaining nut on the pinion shaft with the hexagonal shoulder toward the front of the car, then install the locking washer and locking nut on the front end of the pinion shaft. The propellor shaft and torque tube may then be assembled and the axle installed in the car.

Replacement and Adjustment of Rear Axle Ring Gear and Drive Pinion

In order to assure quiet operation and long life of Cadillac and LaSalle rear axles, it has been the practice of the Cadillac Motor Car Co. to handle all replacement and adjustment operations on the ring gear and drive pinion on an exchange basis. This was done to insure such accuracy as could be maintained only by careful matching of parts from a sufficiently large stock. Improvements in materials and in gear cutting methods have, however, made it possible to produce rear axle gears that can be satisfactorily serviced in the field. Accordingly the Factory Parts Division are now supplying ring gears and pinions in matched sets for service on V-8 and V-12 both "B" and "C" series cars.

While the practice of replacing the differential carrier assembly has been discontinued on these car models it is still in effect on the V-16. In case the rear axle gears need replacing or adjusting on V-16 cars, the entire differential carrier assembly should be replaced and the old one returned to the factory on the regular exchange basis as in the past.

When the ring gear and drive pinion are replaced on the V-8 and V-12 cars, the double-row ball bearing on the front end of the drive pinion shaft should also be replaced. Experience has proved that trouble may develop from wear on this bearing, whenever the gears are worn sufficiently to require replacement, if the bearing is not replaced at the same time the gear replacement is made.

It is also advisable to replace the cork gasket on the retainer for the front pinion bearing and, in cars which have the late type axle oil retainer, the felt washer should be replaced. In this connection, whenever the axle is down for inspection or replacement of gears, the retainer nut should be inspected and the grooved type installed whenever the plain type is found.

Complete instructions for replacing and adjusting the rear axle gears on V-8 and V-12 cars are given below:

Removal and Disassembly

The replacement of the rear axle ring gear and drive pinion necessarily requires the removal and disassembly of the differential gear assembly. To remove this unit, it is necessary first to remove the rear axle assembly from under the car. Then the axle shafts, the torque tube, the propeller shaft, the differential cover and reinforcement plate are removed, after which the differential gear assembly is dismounted or taken off of the differential carrier. See Fig. 1, Plate 3A.

The differential gear assembly is disassembled in the following order:

1. Remove caps for differential side bearings and take out adjuster rings.
2. Remove differential unit.
3. Remove ring gear from differential case and gear mount.
4. Remove drive pinion, bearings, front bearing retainer and bearing spacer.

NOTE—Do not lose or damage the shims between the front bearing retainer and the front end of the differential carrier.

5. Wash parts in gasoline or kerosine and dry with air after which check all parts carefully.

The differential pinions and side gears may be removed simply by removing the retaining screw in the pinion shaft and driving out this shaft. It is not necessary to remove these gears, however, for replacing the ring gear and drive pinion.

Examine the bearings, the bearing mounts, and the differential gears. They should be smooth, free from pits and the gears and bearings should not be chipped or broken.

The flange of the differential case should also be checked for wobble and eccentricity: it should run true laterally and radially within .001 in. or .004 in. when tested on the back of the ring gear. A convenient way of making this test is to install the differential case and bearings in position in the carrier and check the flange with a dial indicator clamped to the carrier or bearing cap studs using holder HM91220.

The hubs of the differential side gears should have no more than .005 in. radial clearance in the differential case. Endplay in these gears should not exceed .020 in.

The two differential pinion gears should have a clearance of not more than .010 in. on the pinion shaft and not more than .020 in backlash with the side gears.

Reassembly and Installation

Reassembly of the differential gear assembly is accomplished in the following order:

1. Install ball bearings, bearing spacer, front bearing retainer and bearing retaining nuts on drive pinion shaft, being sure to get the retainer back of the front bearing and with this bearing fitted in the cup of the retainer.

REAR AXLE—Service Information

2. Install drive pinion and bearings in differential carrier, being sure to install the spacing shims between the front bearing retainer and the front end of the differential carrier. Make an initial adjustment on the drive pinion as explained in section "Adjustment of Drive Pinion." Tighten bearing retaining nuts on the front end of the drive pinion shaft and lock them in position.

NOTE—Lubricate the drive pinion bearings when installing them to insure initial lubrication.

3. Install differential side gears and pinions (provided these gears were removed).

4. Install ring gear on differential case. Tighten retaining screws securely using an 18-inch wrench and lock with wire. Wire two screws together, installing the wire in such a way that tension of the wire on the screws will tend to tighten the screws rather than loosen them.

5. Install differential unit in position in differential carrier, after which install the adjuster rings and the bearing caps.

6. Make initial adjustment of gear mesh. See section "Adjustment of Ring Gear."

7. Install the axle shafts, lubricating the felt washers in the wheel.

8. Install rear axle under car.

9. Adjust gear mesh as explained under "Testing Ring Gear for Proper Tooth Contact."

10. Install reinforcement plate, differential cover and fill differential to proper level with recommended transmission and rear axle lubricant.

Adjustment of Gear Mesh

In the design of the rear axle provision is made for adjusting the drive pinion and ring gear so that the teeth may be meshed correctly, and for locking all adjustments securely. Ordinarily old gears that have been running noisy for some time cannot be adjusted satisfactorily to eliminate the noise. In such cases it is necessary to replace the gears with new ones.

A ring gear and drive pinion are shown in Fig. 3 Plate 3A, set in the proper running position, and in this position all tooth dimensions, theoretically, converge to cone centers

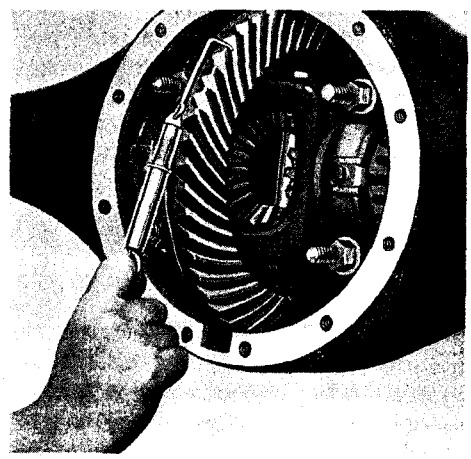


Fig. 1. Checking adjustment of differential side bearings. A pull of 8 to 10 pounds should be required to turn the ring gear.

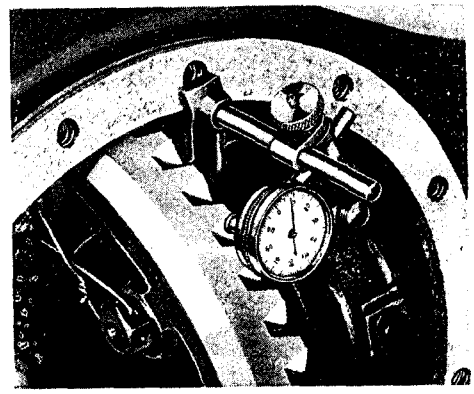


Fig. 2. Checking backlash between ring gear and drive pinion with dial indicator and holder, Tool No. HM-91220. Backlash should be .004 to .012 in.

"A." In this position, only the pitch lines of the ring gear and drive pinion coincide; and although all other proportions of tooth shape converge toward the cone centers of the gears, they are in no place parallel to the pitch line.

It is, therefore, evident that the shifting of gears from the correct position, results in throwing the pitch lines out of parallel and changing the contact of the gear and pinion from a full contact toward either the toe or the heel of the ring gear. (See Figs. 5 and 6, Plate 3A.) If the ring gear is moved away from the drive pinion the contact is moved toward the heel; if the gear is moved closer to the pinion, the contact is moved toward the toe of the gear teeth. The reason for this is that when the ring gear is moved away from the pinion the heel of the tooth will be last in mesh. If the gear is moved toward the pinion, the backlash or clearance is first taken up at the toe.

Before an attempt is made to adjust the gear mesh, the rear axle lubricant should be drained and the gears cleaned.

Adjustment of Drive Pinion

An initial adjustment is made on the drive pinion when putting the differential and pinion assembly together by installing the proper number of shims between the front pinion bearing retainer and the front end of the differential carrier use sufficient shims to give a total thickness of .075 to .090 in. These shims are supplied by the Factory Parts Division in thickness of .010 in., .015 in., and .035 in.

The final adjustment of the drive pinion is made according to the tooth contact as explained under "Testing Ring Gear for Proper Tooth Contact."

Adjustment of Differential Side Bearings

To adjust the differential side bearings, it is necessary first to remove the locking plates for the adjuster rings and to loosen the bearing caps slightly. The adjusters are then turned, using tool No. HM72799 to tighten the bearings so that a pull of 8 to 10 pounds, measured at the circumference of the ring gear, is required to turn this gear. This test can be made with a spring scale hooked on one of the ring gear teeth as shown in Fig. 1 on this page. An initial pull of about 15 pounds will be required to start the gear, but as soon as it is started the pull should drop to 8 to 10 pounds.

After the adjustment is completed, the bearing caps must be tightened and the locking plates installed.

REAR AXLE

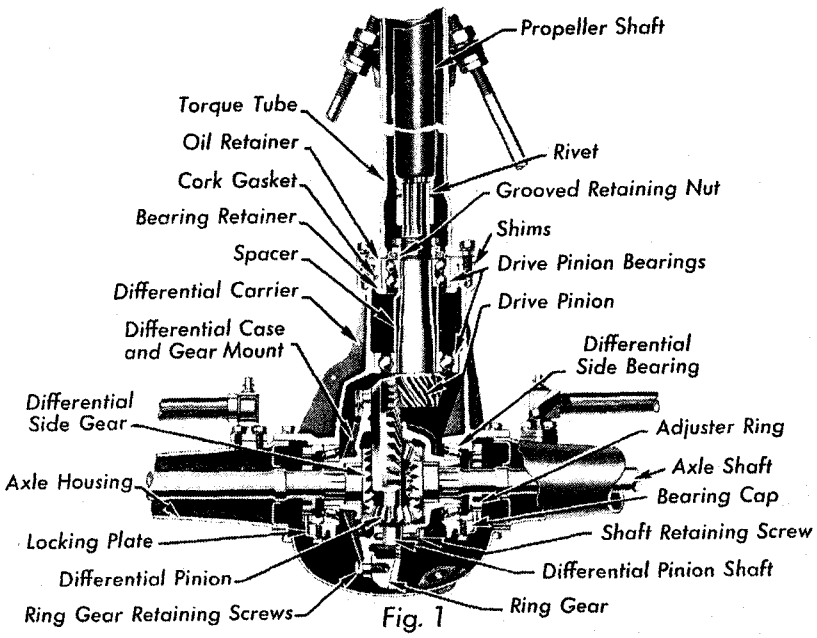


Fig. 1
Rear Axle Gear Assembly

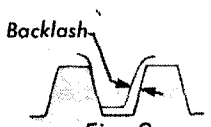


Fig. 2
Backlash between drive pinion and ring gear should be .004 to .012 in. Check with dial indicator

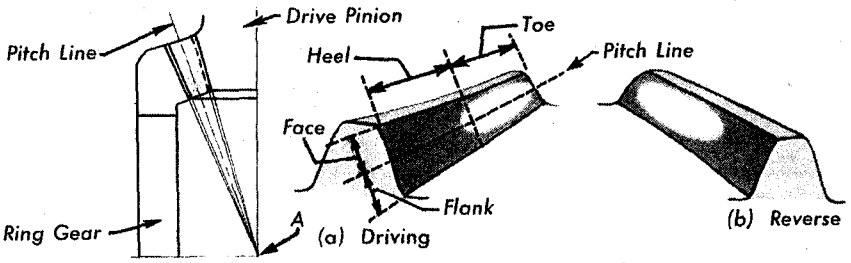
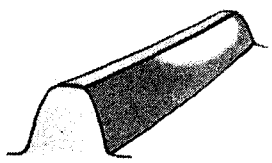


Fig. 3–Correct Ring Gear Tooth Contact



Face Contact - Ring Gear Tooth. Correct by moving drive pinion toward ring gear

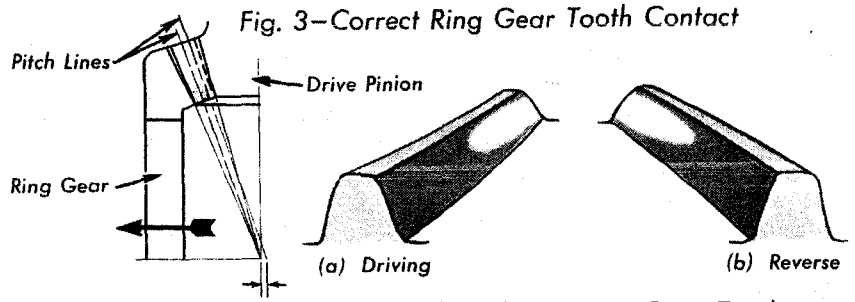
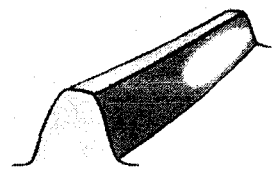


Fig. 5–Excessive Toe Contact — Ring Gear Tooth
To correct contact increase backlash between gears (keeping it under .012 in.) by moving ring gear away from drive pinion



Flank Contact - Ring Gear Tooth. Correct by moving drive pinion away from ring gear

Fig. 4
To change profile contact on ring gear teeth, move pinion endwise by installing shims of different thickness between front pinion bearing retainer and front end of differential carrier

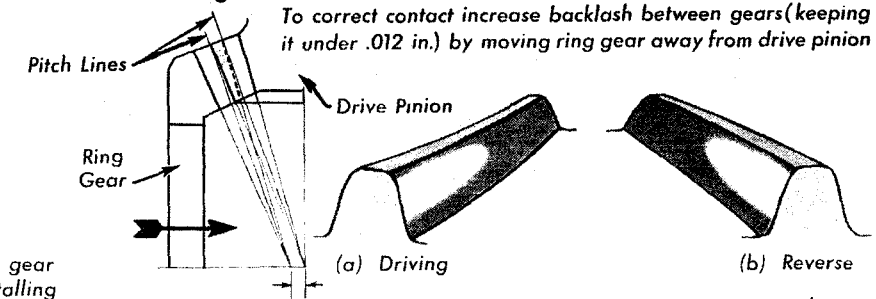


Fig. 6–Excessive Heel Contact — Ring Gear Tooth
To correct contact decrease backlash between gears (keeping it over .004 in.) by moving ring gear toward drive pinion

Plate 3A. Details of Rear Axle Gear Adjustment

REAR AXLE—Service Information

Adjustment of Ring Gear

The adjustment of the ring gear is made by moving the ring gear and differential case sideways. This is accomplished by turning the adjuster rings (Use Tool No. HM72799) for the differential side bearings an equal amount as required. Although the ring gear tooth contact is the next important consideration, the backlash should be checked before checking for tooth contact, as both backlash and tooth contact are controlled by the same adjustment and backlash must be kept within the specified limits of .004 to .012 in. while adjusting the tooth contact.

When checking the backlash the axle shafts should be pulled out of the differential side gears and the drive pinion held stationary. The amount of backlash can be measured by means of a dial indicator with holder, tool No. HM91220, clamped to the axle housing and in contact with a tooth on the ring gear as shown in Fig. 2, page 13B. If the backlash is within these limits the gears can be checked for proper meshing.

Correct meshing of the ring gear and drive pinion can best be determined by painting the working surface of the ring gear teeth with red lead mixed with gasoline as a thinner, or Prussian blue as explained under "Testing Ring Gear for Proper Tooth Contact."

After the correct position for the ring gear is found, the adjustment of the bearings should be checked. The bearing caps are then tightened and the locking plates and differential cover are installed, after which the differential should be properly lubricated.

Testing Ring Gear for Proper Tooth Contact

Correct meshing of the gears can best be determined by first painting the working surfaces of the ring gear teeth with red lead thinned with gasoline, or Prussian blue, and turning the ring gear several revolutions by hand and then noting the tooth contact obtained on the ring gear under load. When the gears are turned the red lead or Prussian blue is wiped off at the point where the teeth of the ring gear and pinion mesh.

It is important to make this test by hand first so that an initial adjustment can be made if the gears are not correctly meshed. The tooth form may easily be ruined by running the gears under load when not correctly meshed.

To test the gear mesh under load the rear wheels should be raised off the floor and driven in both directions with the engine. The necessary load can be obtained by applying the brakes. **Care should be taken in making this test not to run the ring gear more than ten or twelve revolutions at a time before checking the tooth contact.** If the bearings and gears are in proper adjustment, the lengthwise tooth contact on the ring gear, which is the contact along the length of the tooth, and the profile tooth contact on the ring gear, which is the contact from top to bottom of the tooth, will appear as shown in Fig. 3, Plate 3A (a) for the forward speeds and as shown in (b) for the reverse speed.

It will be noted that the tooth contact for the forward speeds under light load is at the small end or "toe" of the tooth. This is necessary due to spring in the housing and the bearings under driving loads in the forward speeds, under which condition the tooth contact will shift toward the large end or "heel" of the tooth. Under no conditions should the tooth contact on the ring gear under light load be at the heel of the tooth, as a heavy load on the gears in any of the forward speeds would tend to concentrate the load at this point.

In reverse, the tooth contact does not shift as far toward the heel under load as the driving contact. It is, therefore, permissible to have the contact on the reverse side more nearly at the center of the tooth than is the case on the driving side.

The profile contact, or the contact from top to bottom, on the face and flank of the tooth, may appear at any position throughout the length of the tooth. For proper meshing of gears the greater part of the profile contact on the ring gear should be about the middle of the tooth at the pitch line slightly below the outer edge. Referring to Fig. 3, it will be noted that the contact surface for the ideal condition extends only slightly below the pitch line and almost to the edge of the tooth. If the contact surface favors a lower position on the flank of the ring gear tooth as is shown in Fig. 4, the profile contact is too low. If, on the other hand, the contact surface is totally above the pitch line and also shows a decided contact on the top point or face of the tooth, the profile contact is too high.

To correct a low profile or flank contact, move the drive pinion away from the ring gear. This adjustment will increase the backlash and it may be necessary to move the ring gear toward the drive pinion to keep the backlash within the limits. Changing the position of the ring gear will alter the lengthwise contact on the tooth and to obtain correct tooth contact, illustrated in Fig. 3 (a) and (b), several adjustments for lengthwise and profile contact, may be required.

To correct a high profile or face contact, move the drive pinion toward the ring gear. This will decrease the backlash and it may be necessary to move the ring gear away from the pinion to maintain the proper amount of backlash. Changing the position of the ring gear will change the lengthwise contact on the tooth and to obtain a correct tooth contact, illustrated in Fig. 3 (a) and (b) several adjustments for lengthwise and profile contact may be required. After obtaining the proper tooth contact under load, check the backlash to see if it is within the limits.

When the "toe" contact on both the driving and reverse sides of the tooth is extended too close to the end of the tooth as shown in Fig. 5 (a) and (b) respectively, increase the backlash between the gears, keeping it under .012 in. by moving the ring gear away from the drive pinion. This may also change the profile or top-to-bottom contact slightly which should be changed by adjusting the pinion.

To correct an excessive "heel" contact on both the driving and reverse sides of the tooth, illustrated in Fig. 6 (a) and (b) respectively, decrease the backlash between the gears, keeping it over .004 in. by moving the ring gear toward the drive pinion. This may change the profile contact slightly as when correcting a "toe" contact, which will also necessitate changing the pinion adjustment.

If the tooth contact obtained under load varies widely from the tooth contact illustrated and described, it would indicate that the gears are worn. In this event, the gears should be replaced.

BODY

After removing the moulding screws (the invisible screws can be located by running a screwdriver up and down the glass-run channel), the garnish moulding can be removed by pulling out at the top and lifting up if the bayonet type lock is used or by releasing the trigger with a screwdriver if the trigger type is used. See Plates 6 and 7 for location and type of fastening.

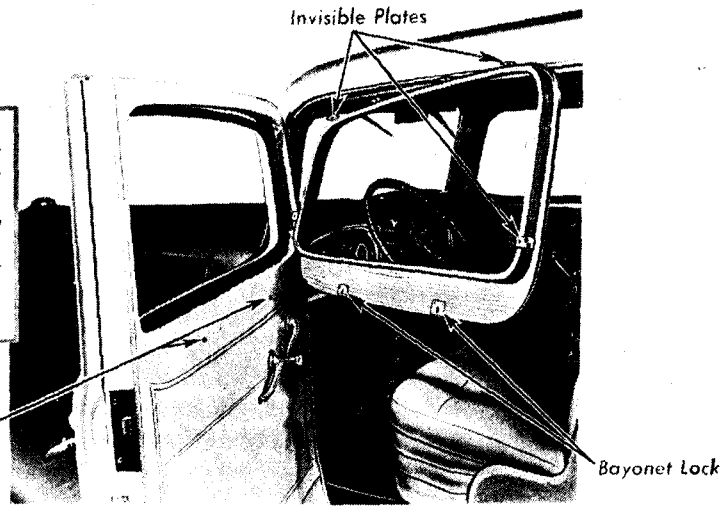


Fig. 1
Garnish moulding removed to show bayonet locks and invisible plates.

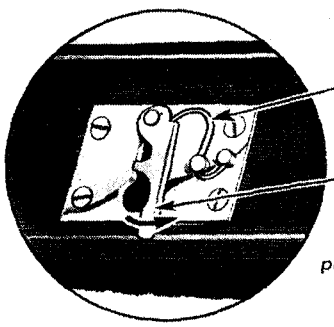


Fig. 2
Trigger Lock
To unlock, move trigger in direction indicated by arrow.

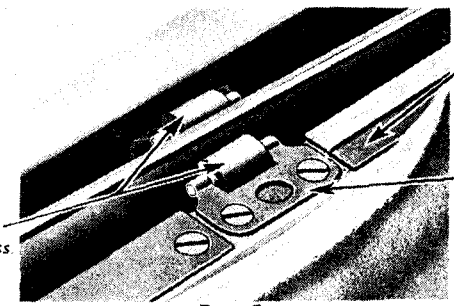


Fig. 3
Rubber rollers for holding front door glass rigid in open positions.

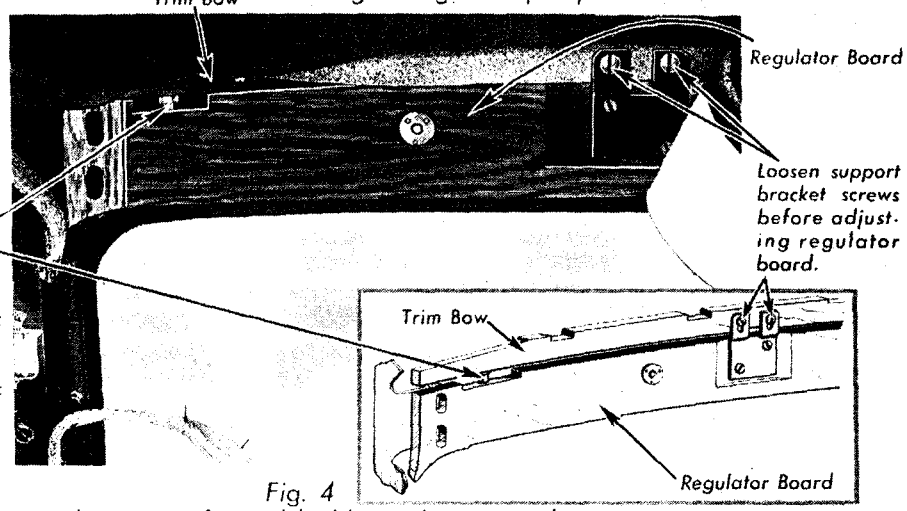


Fig. 4
Adjustment of Windshield Regulator Board
Before adjusting the regulator board, remove the windshield moulding, the sun visor and the two screws on the right-hand end of the header board. Then loosen the trim, so that the screws in the support bracket at each end of the regulator board will be accessible.

Plate 4. Door Window Details and Windshield Adjustment

BODY

General Description

The bodies are of the same rugged construction on both Cadillac and LaSalle cars but differ in appointments, trim, beading and other minor details.

In much of the frame-work construction glued joints are eliminated and metal brackets are used to hold the wood parts in place without touching each other. This arrangement reduces the possibility of squeaks.

The body panels are of one-piece design with no separate mouldings. The drip mouldings are stamped into the roof rail panel, forming an integral part of it. This construction eliminates the possibility of wood rot, squeaks and Duco chipping at these points.

The body is insulated against drumming noise and engine heat. The inside of the cowl from the dash back to the pillar, is covered with ⅜-in. felt insulation cemented securely in place. To insulate against engine heat, the 345-B body has $\frac{13}{16}$-in. insulation inside of the dash, while the other models have 1¼ in. insulation between the dash and the "dummy" dash or cover.

Comfort in the driver's compartment is further assured by ventilation through a large ventilator in the top of the cowl. The openings in the toe-boards for the controls are closed with tight fitting rubber grommets. There is also a ⅜-in. felt pad under all carpets and under the front and rear seat cushions. All doors and body panels have special composition insulation cemented to the inside of the panels.

The front seat cushion is in two parts, only the driver's half being adjustable. The adjusting mechanism is controlled by a crank. Marshall springs are used throughout.

The body is mounted on rubber shims. However thin fabric pads are used wherever necessary for proper body alignment.

DOORS

Two hinges are used on each door. Each hinge is provided with two bronze bushings and a chromium plated hinge pin. All-Weather Phaetons have Fleetwood type barrel hinges, while the hinges on the open models are all concealed.

The dove tails are self-adjusting, thus facilitating door alignment.

The door locks are of such design as to permit the locking of all doors, including the right front door, from the inside.

To lock a door from the inside the remote control handle should be lifted up. To prevent the driver from locking himself out all doors are arranged so that the inside locking mechanism is automatically released by the movement of the lock bolt when the door is closed.

To lock the car from the outside, all doors except the right front door must first be locked from the inside by lifting the remote control handle. The right front door is then locked with the key on the outside in the conventional manner.

The outside door handles are fastened with a set screw through the face of the lock. This screw is concealed underneath the chromium plated lock escutcheon plate.

The inside door handles (window regulator handle, windshield regulator handle and remote control handles) are serrated on their shafts and locked in place by a small plunger located inside of the handle hub.

WINDOWS

The glass in the front doors of all closed cars operates between two rubber rollers at the lower side of the window opening. These windows also have a vertical guide and do not depend on the glass run channels for support.

The glass run channels are made in one piece, eliminating the possibility of noise at the joints. The channels have chromium-plated edges and inserts of special carpet material.

The garnish mouldings are made in one piece and are supported with invisible fastenings. Because these fastenings are invisible, it is very necessary to know where they are located on the various mouldings before proceeding to remove the moulding.

In general the method is to hold the bottom of the garnish moulding with a lock of either the bayonet or trigger type. The sides and top of the mouldings on Fleetwood bodies are held by plates which slip under the glass run channels and are held by screws through the channels. On the Fisher bodies the screws go through the garnish moulding and are plainly visible.

WINDSHIELD

The windshields on all closed cars are of the VV type. The side and top windshield garnish moulding is in one piece and is held in place by visible screws on Fisher bodies and invisible

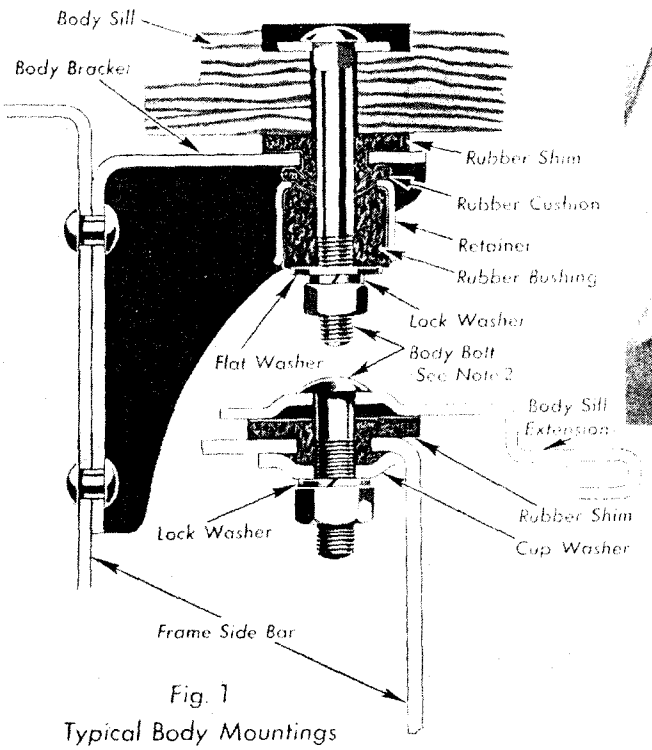


Fig. 1

Typical Body Mountings

Tighten body bolt just enough to flatten lock washer. Check alignment of doors during this operation. Use thin fabric shims on top of rubber shims when necessary to align doors.

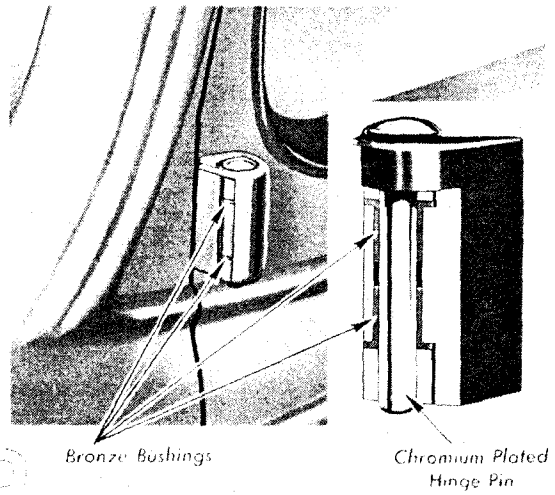


Fig. 2

View of door hinge with insert showing bronze bushings.

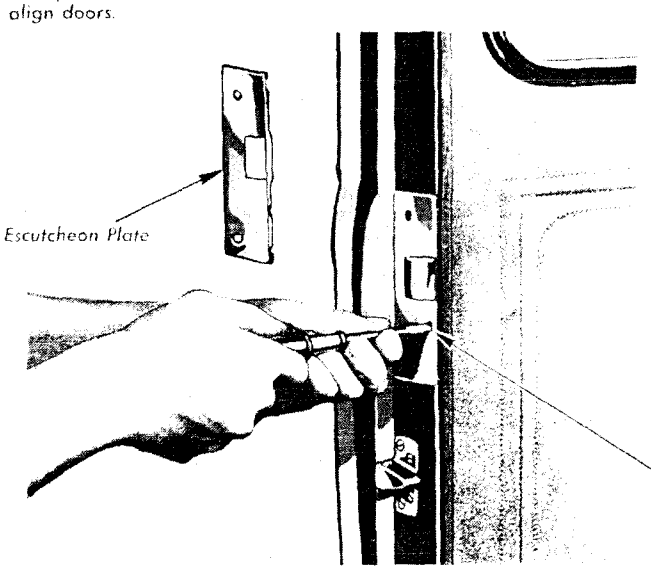


Fig. 3

Set screw for outside door handle is concealed under lock escutcheon plate. Plate must be removed to remove door handle.

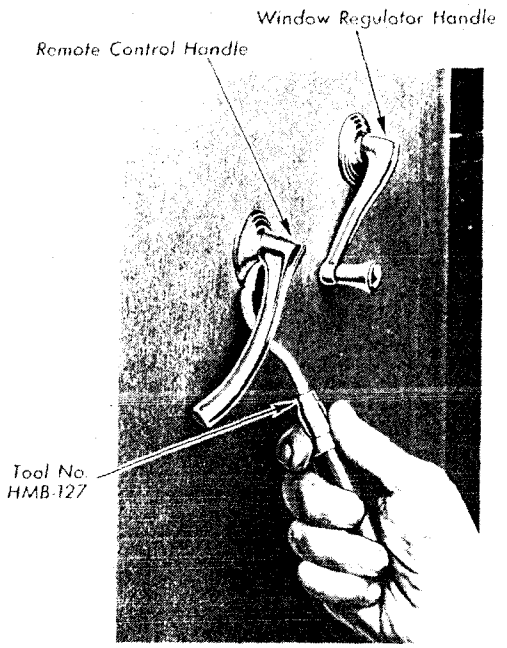


Fig. 4

Removing Inside Door Handle

The inside door handles and windshield regulator handle are serrated on their shafts and locked in place by a small plunger located inside of the handle hub. To remove the handle it is necessary to release the plunger with the special tool shown above.

Plate 5. Body Mounting and Door Details

plates on Fleetwood bodies. The top and back panels on both body types are held in place by invisible fastenings.

The windshield cleaner is of the swinging arm type with two arms operated in tandem by a single motor on the outside of the windshield regulator board. The tandem linkage is between the windshield regulator board and the steel header.

The rear view mirror is of the ball-joint type and is fastened to the lower edge of the windshield regulator board on the closed cars.

Service Information

1. Adjusting Window Guide Roller

The guide rollers at the lower edge of the front door windows are adjusted by removing the garnish moulding and moving the inside roller closer to or farther away from the window glass. When properly adjusted the roller should press against the glass just enough to hold it. If the roller is adjusted so tight that it slides instead of turning, the glass may be marked. In some cases when the roller must be backed off, it will necessitate cutting some material from the garnish moulding to allow sufficient clearance for the roller.

2. Body Bolts for Service

In order to minimize the number of body bolt sizes necessary to stock, the body bolts for service are supplied in standard lengths of 3½, 5½ and 7⅝ inches. Not all bolts used in production are of these lengths. Therefore, when replacing body bolts, it is necessary to measure the old bolts and select new ones of corresponding lengths or of lengths nearest to that of the old bolts. The bolts selected should be long enough to permit proper adjustment which is necessary with the rubber body shims.

3. Care of Top Coverings

The only attention required by top coverings, aside from periodic inspection for checks and possible leaks, is an occasional cleaning with clear water.

The use of top dressings on the top is not recommended, either to restore the lustre or to prevent leaks. Neither is a top dressing recommended as a preventive of deterioration, as most dressings contain some sort of solvent that causes the top covering to deteriorate.

Grease and oil will also damage top material. It is important therefore to avoid the use of oils of any nature, including kerosene, mineral oils, vegetable oils, animal oils or waxes. For this reason also, avoid the use of oil in eliminating squeaks in the roof construction.

4. Cleaning Khaki Top Materials

Top dressing of any kind and cleaning fluids containing oil, naptha, gasoline, energine, strong chemicals, or any other liquid which will dissolve rubber, should never be used on the khaki top material of convertible and open models. As these tops are made of double texture material impregnated with rubber, such preparations would disintegrate the rubber content and ruin the fabric.

The safest cleaning method is to use warm water and a sponge or brush; if necessary, Ivory soap may be applied sparingly, but care must be taken that all the soap is washed off. Most of the soiled spots can be cleaned up by using only a piece of clean art gum or pure gum rubber.

It is also important to see that the top material is thoroughly dry before the top is lowered.

5. Cleaning Car Upholstery

Care must be exercised in cleaning upholstery material and floor carpets used in car interiors. Some of the fabrics are impregnated with a rubber backing, originally applied as a solution, which binds the nap securely. Use of too much cleaning fluid tends to dissolve this backing, thus loosening the nap.

To avoid this, cleaning fluids should be used sparingly on any upholstery, especially pile. An additional safeguard is the use of factory-approved fluids which are selected for their factor of safety as well as for efficiency in cleaning.

Water stains on upholstery material can easily be removed by brushing off the material thoroughly and then cleaning it with a cloth dampened with Cadillac cleaner. The cleaner should be used sparingly. Let the upholstery dry and smooth over lightly with a very hot iron applied through a damp cloth.

6. Cleaning Chromium-Plated Parts

While chromium-plated parts do not require repeated polishing like nickel, they should be cleaned occasionally to restore the lustre and protect the plating from deterioration.

It is particularly important to clean the plated parts on the chassis, which are exposed to the road elements. In winter, salt and calcium chloride, used on the streets to remove ice, are splashed upon the car, and in summer, the same is true of dust-laying chemicals. Frequent cleaning will prevent these chemicals from acting on the plating.

Chromium-plated parts which have been subjected to the action of chemicals of this sort may require more than cleaning, depending upon the length of time and the strength of the chemicals. In such cases, polishing with a good metal polish will usually remove the discoloration and restore the lustre. Wiping with a cloth dampened in kerosene will help to protect the plating from further deterioration.

Discoloration of chromium-plated parts under the action of chemicals used on roads and pavements, is not an abnormal condition and is not an indication of defective plating.

7. Door Bumper Adjustment

Adjustment of the doors is made by means of different lengths of rubber bumpers. Three lengths of bumpers are available and can be used interchangeably as necessary to suit each individual case.

On the first cars shipped, no bumper plates are provided on the doors and the following bumpers must be used:

First-type Bumper	Identification Number on Bumper	Part No.
Short bumper	107A	4002339
Medium bumper	107C	4023568
Long bumper	107B	4024073

Later cars have bumper plates, Part No. 4220157, on the doors to increase the tension of the bumper on the doors in the closed position.

The second-type bumpers listed below must be used with these plates:

Second-type Bumper	Identification Number on Bumper	Part No.
Short bumper	208	4018317
Medium bumper	209	4003348
Long bumper	210	4026044

Second-type bumpers may be used on early cars by installing bumper plates on the doors. These may be installed where the bumper strikes the door by drilling the screw hole using

the bumper plate as a template and attaching the plate with the screws provided with the plate under Part No. 4220157. Bumpers of the length suitable for the particular cars should be selected.

No attempt should be made to use the first-type bumpers on later cars with the bumper plates as a different shaped bumper is required. Neither should the second-type bumper be used on early cars without the bumper plate as they will not have the proper tension on the doors.

8. Installing Cowl Bead

The cowl bead is attached by concealed fastenings. Two types of these fastenings have been used.

On the first bodies assembled the bead is held at each end by a long bolt which goes through the sill and screws into a tapped plate close to the end of the bead. On later bodies a stud is used which is a part of the bead itself. This stud goes through the same hole in the sill that was used for the bolt on the first type bead and is anchored with a nut.

When installing a new cowl bead only the second type should be used. The bolt or nut holding the bead in place can be reached with a universal wrench. If the stud extends through the nut too far, it should be cut off.

When installing a bead, the bolt or nut should be drawn up just enough to hold the bead snugly in place. If drawn too tight, the end of the bead may buckle or break.

9. Installing Outside Door Handles

When the door handles are installed on a car, a small spring washer, Part number 4023713, is installed on the shaft to take up end play. Ordinarily, when the handle is removed, the washer remains in place on the end of the handle, but in some cases it may remain inside and drop down in a crevice.

If the door handle is removed for any reason, care should be taken to see that the washer is in place when the handle is reinstalled, or a new washer should be installed.

10. Installing Hood Corner Protectors

When installing the rubber hood corner protectors it is important that the button be pulled all the way through the hole in the hood. The proper method of installing these protectors is first to slip the flange over the edge of the hood and then pull the button through the hole in the hood with a pair of narrow long-nosed pincers. Both edges of the button should be squeezed together when pulling the button through the hole. If only one edge of the button is grasped, the edge may be torn as it is pulled through.

11. Installing Window Regulator Handle on Left Front Door

The proper position for the window regulator handle on the left front door is parallel with the remote control handle in the unlocked position when the window is turned all the way up. This is necessary with first type cars to eliminate the possibility of interference between the driver's hand on the steering wheel and the knob of the window regulator handle.

If it is found that the window regulator handle is not in this position, it should be removed and properly reinstalled. Before taking the handle off, run the window up as far as it will go. Release the spring retaining pin in the handle using tool number B-127. Reinstall the handle in such a position that it will be parallel with the remote control handle when it is in the unlocked position.

12. Removing Windshield Weather Strip

The rubber strip in which the windshield is imbedded in the closed position has a chromium plated bead rolled on to its front edge and this bead is attached to the bead running around the entire windshield by a piece of connecting wire inserted in the ends. A part of the rubber strip itself is held in a recess in the top of the cowl bar.

If this rubber is to be removed for any reason, first remove the ash receiver and the windshield moulding above the instrument panel. Then raise the windshield to clear the rubber and insert a flat tool under the rubber at about the center of the strip and from the front side of the car.

Raise the strip carefully and pull the chromium plated bead away from the wire which holds it to the bead on the sides of the windshield. Use particular care not to kink the bead when lifting it in this manner.

To reinstall the rubber strip, keep the bead bowed slightly and insert the corner wires in the ends of the bead, gently pressing the strip into place. When the strip is in place, seal the ends securely against the side windshield panels with a sufficient amount of "rubber dough" to prevent leakage.

13. Door Garnish Moulding Fastenings on All-Weather Phaeton and Convertible Coupes

On all-weather phaetons, the door garnish mouldings are held in place by three trigger locks on the front doors and by two trigger locks on the rear doors.

The door garnish mouldings on Convertible Coupes are held in place by three trigger locks.

FISHER AND FLEETWOOD BODY TYPE AND JOB NUMBERS

When ordering chassis parts affected by wheelbase, the BODY JOB NUMBER must be given the same as when ordering body parts

Body Type	Job Number	Wheelbase
345-B (LaSalle)		
Fisher Bodies		
2-Pass. Coupe	32-678	130″
2-Pass. Convertible Coupe	32-668	130″
5-Pass. Town Coupe	32-672	130″
5-Pass. Sedan	32-659	130″
5-Pass. Town Sedan	32-652	136″
7-Pass. Sedan	32-662	136″
7-Pass. Imperial Sedan	32-663	136″
355-B (Cadillac)		
Fisher Bodies		
2-Pass. Roadster	32-8-155	134″
2-Pass. Coupe	32-8-178	134″
2-Pass. Convertible Coupe	32-8-168	134″
5-Pass. Sedan	32-8-159	134″
5-Pass. Phaeton	32-8-256	140″
5-Pass. Phaeton with Sliding Windshield	32-8-280	140″
5-Pass. All-Weather Phaeton	32-8-273	140″
5-Pass. Sport Phaeton	32-8-279	140″
5-Pass. Coupe	32-8-272	140″
5-Pass. Sedan	32-8-259	140″
5-Pass. Town Sedan	32-8-252	140″
7-Pass. Sedan	32-8-262	140″
7-Pass. Imperial Sedan	32-8-263	140″
Fleetwood Bodies		
5-Pass. Two-Door Close Coupled Town Coupe	32-8-222	140″
5-Pass. Sedan	32-8-209	140″
5 Pass. Town Car with Opera Seats—leather back	32-8-225	140″
7-Pass. Sedan	32-8-212	140″
†7-Pass. Transformable Cabriolet	4925	140″
7-Pass. Imperial Sedan	32-8-213	140″
*7-Pass. Imperial Sedan	4975-H-4	140″
†7-Pass. Imperial Sedan	4985	140″
7-Pass. Town Car—leather back	32-8-227	140″
7-Pass. Town Car—metal back	32-8-226	140″
370-B (Cadillac)		
Fisher Bodies		
2-Pass. Roadster	32-12-155	134″
2-Pass. Coupe	32-12-178	134″
2-Pass. Convertible Coupe	32-12-168	134″
5-Pass. Sedan	32-12-159	134″
5-Pass. Phaeton	32-12-256	140″
5-Pass. Phaeton with Sliding Windshield	32-12-280	140″
5-Pass. All-Weather Phaeton	32-12-273	140″
5-Pass. Sport Phaeton	32-12-279	140″
5-Pass. Coupe	32-12-272	140″
5-Pass. Sedan	32-12-259	140″
5-Pass. Town Sedan	32-12-252	140″
7-Pass. Sedan	32-12-262	140″
7-Pass. Imperial Sedan	32-12-263	140″
Fleetwood Bodies		
5-Pass. Two-Door Close Coupled Town Coupe	32-12-222	140″

Body Type	Job Number	Wheelbase
Fleetwood Bodies—Continued		
†5-Pass. Convertible Coupe	5085	140″
5-Pass. Sedan	32-12-209	140″
†5-Pass. Imperial Cabriolet	5030FL	140″
†5-Pass. Sedan—metal back	5031S	140″
5-Pass. Town Car with Opera Seats—leather back	32-12-225	140″
†5-Pass. Imperial Sedan with Solid Rear Quarter—leather back	5055	140″
†5-Pass. Imperial Sedan with Folding Rear Quarter—leather back	5055C	140″
†5-Pass. Imperial Sedan—metal back	5031	140″
†7-Pass. Phaeton	5057	140″
7-Pass. Sedan	32-12-212	140″
†7-Pass. Imperial Sedan	5030	140″
†7-Pass. Imperial Sedan	5065	140″
7-Pass. Imperial Sedan	32-12-213	140″
*7-Pass. Imperial Sedan	5075H4	140″
7-Pass. Town Car—leather back	32-12-227	140″
7-Pass. Town Car—metal back	32-12-226	140″
†7-Pass. Imperial Cabriolet	5075FL	140″
452-B (Cadillac)		
Fisher Bodies		
2-Pass. Roadster	32-16-155	143″
2-Pass. Coupe	32-16-178	143″
2-Pass. Convertible Coupe	32-16-168	143″
5-Pass. Sedan	32-16-159	143″
5-Pass. Phaeton	32-16-256	149″
5-Pass. Phaeton with Sliding Windshield	32-16-280	149″
5-Pass. All-Weather Phaeton	32-16-273	149″
5-Pass. Sport Phaeton	32-16-279	149″
Fleetwood Bodies		
5-Pass. Two-door Close Coupled Town Coupe	32-16-222	149″
†5-Pass. Convertible Coupe	5185	149″
†5-Pass. Imperial Sedan	5129	149″
†5-Pass. Imperial Cabriolet	5130FL	149″
5-Pass. Sedan	32-16-209	149″
†5-Pass. Sedan—metal back	5131S	149″
†5-Pass. Special Sedan	5140B	149″
5-Pass. Town Car with Opera Seats—leather back	32-16-225	149″
†5-Pass. Imperial Sedan—metal back	5131	149″
†5-Pass. Imperial Sedan with Solid Rear Quarter—leather back	5155	149″
†5-Pass. Imperial Sedan with Folding Rear Quarter—leather back	5155C	149″
†5-Pass. Imperial Cabriolet	5156C	149″
7-Pass. Sedan	32-16-212	149″
7-Pass. Imperial Sedan	32-16-213	149″
*7-Pass. Imperial Sedan	5175H4	149″
7-Pass. Town Car—leather back	32-16-227	149″
7-Pass. Town Car—metal back	32-16-226	149″
†7-Pass. Transformable Cabriolet	5125	149″
†7-Pass. Imperial Landaulet	5165	149″
†8-Pass. Imperial Sedan	5177	165″

*Same as regular Fleetwood bodies but with 4 inches more headroom. †Special bodies.

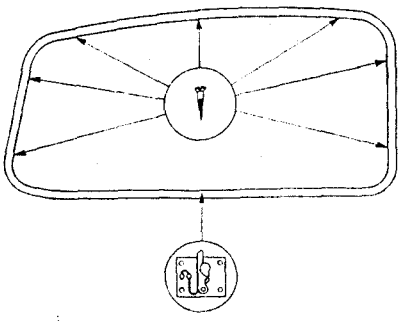


Fig. 1. Front door, all models—Fisher body

7 Visible screws in garnish moulding
1 Trigger lock under garnish moulding

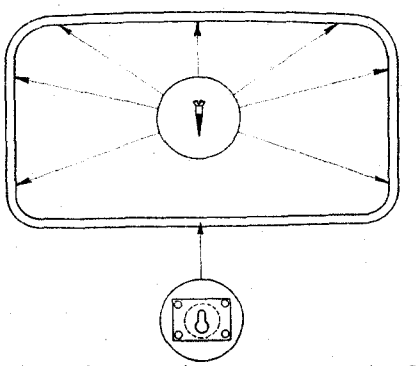


Fig. 3. Rear door and rear quarter, La Salle—Fisher body
Rear quarter, Cadillac—Fisher body

7 Visible screws in garnish moulding
1 Bayonet lock under garnish moulding

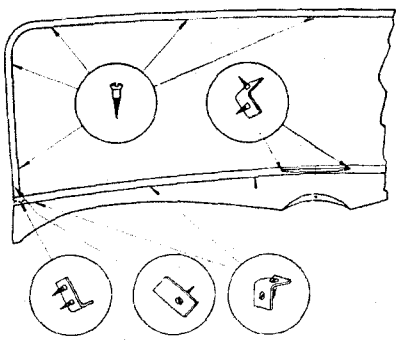


Fig. 5. Windshield, all closed models—Fisher body

9 Visible screws in garnish moulding
6 Plates in finishing panel; also 2 screws in center under the panel
2 Clips in lower garnish moulding inside ash receiver hole; also 1 plate at each end

Windshield, all models—Fleetwood body

Same as Fisher except lower screw in garnish moulding at each side is replaced with plate and invisible screws

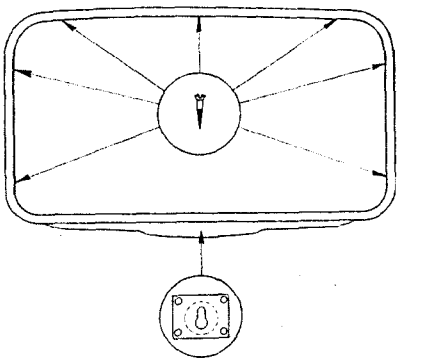


Fig. 2. Rear door, Cadillac—Fisher body

7 Visible screws in garnish moulding
1 Bayonet lock under finishing panel

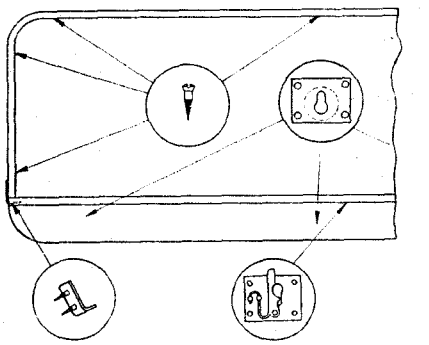


Fig. 4. Partition, Imperial Model—Fisher body

7 Visible screws in garnish moulding
3 Bayonet locks in back panel
1 Trigger lock at center of top panel; also 1 plate at each end

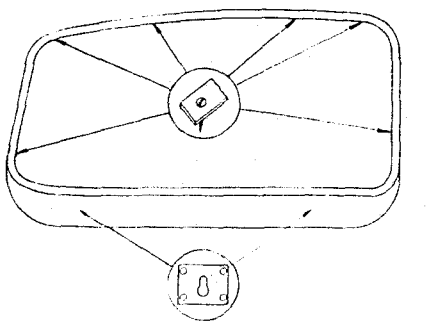


Fig. 6. Front door, all models except Imperial and Town Car—Fleetwood body

6 Invisible plates under glass channel runs at top and rear side of window
2 Bayonet locks under finishing panel

Plate 6. Location and Type of Moulding Fastenings—Fisher and Fleetwood Bodies—(See note 13)

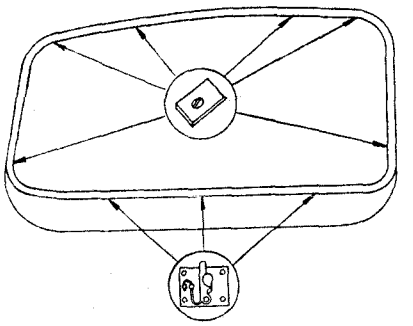


Fig. 1. Front door, Imperial and Town Car—Fleetwood body

6 Invisible plates under glass channel runs at top and rear side of window
1 Trigger lock under garnish moulding

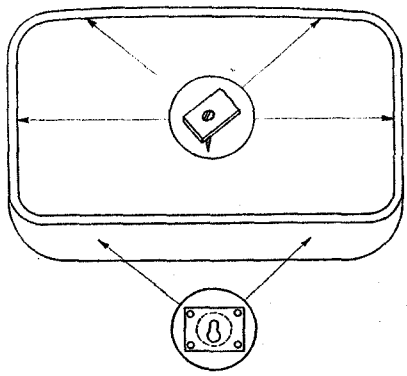


Fig. 2. Rear door, all models—Fleetwood bodies

4 Invisible plates under glass channel runs
2 Bayonet locks under finishing panel

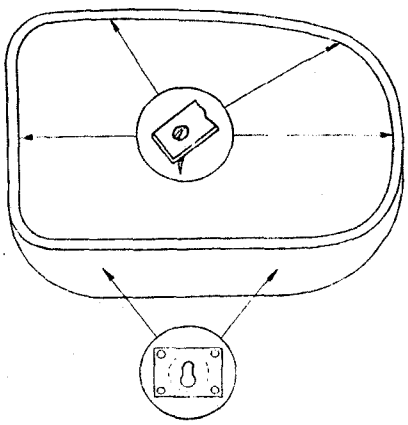


Fig. 3. Rear quarter, all models—Fleetwood body

4 Invisible plates under glass channel runs
2 Bayonet locks under finishing panel

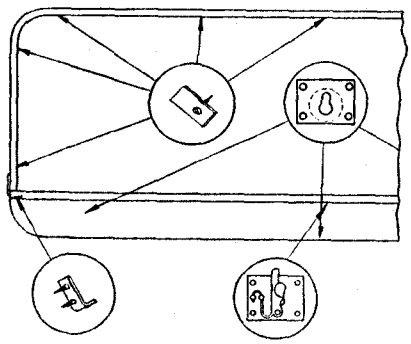


Fig. 4. Partition, Imperial Model—Fleetwood body

9 Invisible plates under glass channel run
3 Bayonet locks under back panel
1 Trigger lock at center of top panel; also 1 plate at each end

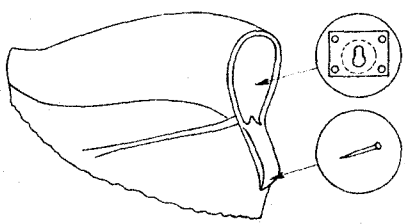


Fig. 5. Arm rest, all models—Fleetwood body

1 Bayonet lock at center; also small brad in lower corner of panel. To remove panel drive brad through panel and lift up

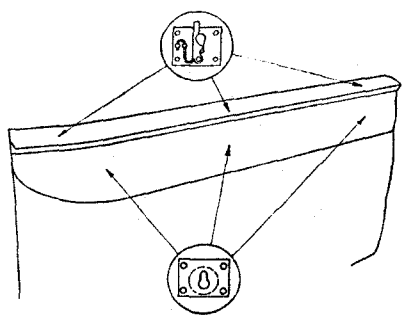


Fig. 6. Front seat, all models—Fleetwood body

3 Bayonet locks under back panel
3 Trigger locks under top panel

Plate 7. Location and Type of Moulding Fastenings—Fleetwood Bodies

FISHER AND FLEETWOOD BODY TYPE AND JOB NUMBERS FOR "C" SERIES CARS

Body Type	Job Number	Wheelbase
345-C (LaSalle)		
Fisher Bodies		
2-Pass. Coupe	33-678	130″
2-Pass. Convertible Coupe	33-668	130″
5-Pass. Town Coupe	33-672	130″
5-Pass. Sedan	33-659	130″
5-Pass. Town Sedan	33-652	136″
7-Pass. Sedan	33-662	136″
7-Pass. Imperial Sedan	33-663	136″
355-C (Cadillac)		
Fisher Bodies		
2-Pass. Roadster	33-8-155	134″
2-Pass. Coupe	33-8-178	134″
2-Pass. Convertible Coupe	33-8-168	134″
5-Pass. Phaeton	33-8-256	140″
5-Pass. All-Weather Phaeton	33-8-273	140″
5-Pass. Coupe	33-8-272	140″
5-Pass. Sedan	33-8-259	140″
5-Pass. Town Sedan	33-8-252	140″
7-Pass. Sedan	33-8-262	140″
7-Pass. Imperial Sedan	33-8-263	140″
Fleetwood Bodies		
5-Pass. Sedan	33-8-209	140″
5-Pass. Town Car with Opera Seats—leather back	33-8-225	140″
7-Pass. Sedan	33-8-212	140″
7-Pass. Imperial Sedan	33-8-213	140″
7-Pass. Town Car—leather back	33-8-227	140″
7-Pass. Town Car—metal back	33-8-226	140″
370-C (Cadillac)		
Fisher Bodies		
2-Pass. Roadster	33-12-155	134″
2-Pass. Coupe	33-12-178	134″

Body Type	Job Number	Wheelbase
Fisher Bodies—Continued		
2-Pass. Convertible Coupe	33-12-168	134″
5-Pass. Phaeton	33-12-256	140″
5-Pass. All-Weather Phaeton	33-12-273	140″
5-Pass. Coupe	33-12-272	140″
5-Pass. Sedan	33-12-259	140″
5-Pass. Town Sedan	33-12-252	140″
7-Pass. Sedan	33-12-262	140″
7-Pass. Imperial Sedan	33-12-263	140″
Fleetwood Bodies		
5-Pass. Sedan	33-12-209	140″
5-Pass. Town Car with Opera Seats—leather back	33-12-225	140″
7-Pass. Sedan	33-12-212	140″
7-Pass. Imperial Sedan	33-12-213	140″
7-Pass. Town Car—leather back	33-12-227	140″
7-Pass. Town Car—metal back	33-12-226	140″
452-C (Cadillac)		
Fisher Bodies		
2-Pass. Roadster	33-16-155	143″
2-Pass. Coupe	33-16-178	143″
2-Pass. Convertible Coupe	33-16-168	143″
5-Pass. Phaeton	33-16-256	149″
5-Pass. All-Weather Phaeton	33-16-273	149″
Fleetwood Bodies		
5-Pass. Sedan	33-16-209	149″
5-Pass. Town Car with Opera Seats—leather back	33-16-225	149″
7-Pass. Sedan	33-16-212	149″
7-Pass. Imperial Sedan	33-16-213	149″
7-Pass. Town Car—leather back	33-16-227	149″
7-Pass. Town Car—metal back	33-16-226	149″

BODY—General Description—Service Information

General Description

The bodies on the "C" series cars are of the same rugged construction but differ in appointments and other minor details. They embody a number of new features including the Fisher No-Draft (I. C. V.) ventilating system.

The No-Draft ventilating system includes pivoting glass panels in the front door and rear quarter windows on all 5-and 7-passenger sedans and the rear doors on Town sedans and Town cars, and the cowl ventilator which is baffled and drained in such a way as to be completely rainproof. The ventilating panels are controlled by handles or cranks conveniently located just below the window. The rear quarter windows are stationary. All window ventilator controls are worm-geared for easy operation.

There are two types of front doors, which differ in the window and ventilator construction. With the first type doors, it is necessary to lower the window glass far enough to disengage it from the ventilating panel before the ventilating panel can be opened or closed. The window glass, however, can be raised or lowered as desired.

The second type doors have a stationary division channel between the ventilator and the window glass so that the ventilating panels can be opened or closed independently of the window glass.

The garnish mouldings are similar to those used on the "B" cars but the method of retaining them in place differs in that there are no invisible fastenings at the sides and top. Visible screws are used at these points for holding the garnish mouldings in position.

The trigger type lock is employed at the lower side of the garnish mouldings on all door windows while a bayonet lock is used at the rear quarter windows.

The garnish moulding finishing panels are separate from the garnish mouldings on the "C" series Cadillac bodies. These panels on early cars are held in place by bayonet locks such as used on the garnish mouldings. On later cars, hanger plates are also used in addition to the bayonet locks for fastening the finishing panels in place.

Service Information

14. Replacing Ventilator Glass

Replacement of the ventilator glass is the same on all cars and can be accomplished without removing the ventilator assembly or disturbing the garnish moulding or control handle. Since the glass is a tight press fit in the channel, special tools should be used for removing and installing it.

The removal of the ventilator glass requires the use of a puller, Part No. B-176. If the ventilator glass is to be reinstalled or used again, friction tape should be used between the puller clamp and the glass to prevent the clamp from marring or scratching the glass surface.

The glass is installed by pushing it into the channel using the replacing tool, Part No. B-175. Before installing a ventilator glass, first place 2-inch strips of glass filler over the top and bottom edges of the glass, arranging the strips at the rear end of the edge so that they will come under the ends of the channel when the glass is installed in position. Then wrap the three edges of the glass that go in the channel with a single strip of the glass filler. This filler is a special tape obtainable from the Factory Parts Division in rolls of any length desired. Two thicknesses of this filler tape are available. Thin filler can be secured under Part No. 4035726 and medium filler under Part No. 4035727. If necessary, in extreme cases, two thicknesses of thin filler can be used.

After wrapping the glass with the filler, spring the two ends of the glass channel slightly together or toward each other and start the glass in the channel a few inches by hand, placing the glass in the lower end first and then forcing it into the upper end.

If either the top or the bottom edge of the glass feeds in faster than the other one when forcing the glass into the channel, the replacing tool should be adjusted up or down to change the pressure point, bringing it closer to the edge which is lagging. The lagging edge should also be tapped gently with a block of wood and hammer to assist in forcing the glass evenly into the channel. The glass should be pressed in even with both ends of the glass channel.

The ends of the channel are then pressed down on the glass and the ends of the glass filler trimmed off even with the edge of the channel.

If the weather strip loosens from the retainer, it should be cemented in place with FS-681 ventilator cement and allowed to dry for at least an hour under pressure.

15. Removing Ventilator Control Handle

Two different types of control handles are used for operating the No-Draft ventilators. The early handles are of the T-type while the later handles are of the crank type. Two methods of mounting these handles are used. One type of mounting is used when the regulator control shaft passes through the belt finishing panel and the other type is used on cars where the finishing panel is omitted.

With the first type mounting the handle is fastened to the finishing panel by means of lugs or wood screws and merely slides on the regulator shaft when the panel is installed in position. This handle is, therefore, removed and installed with the finishing panel.

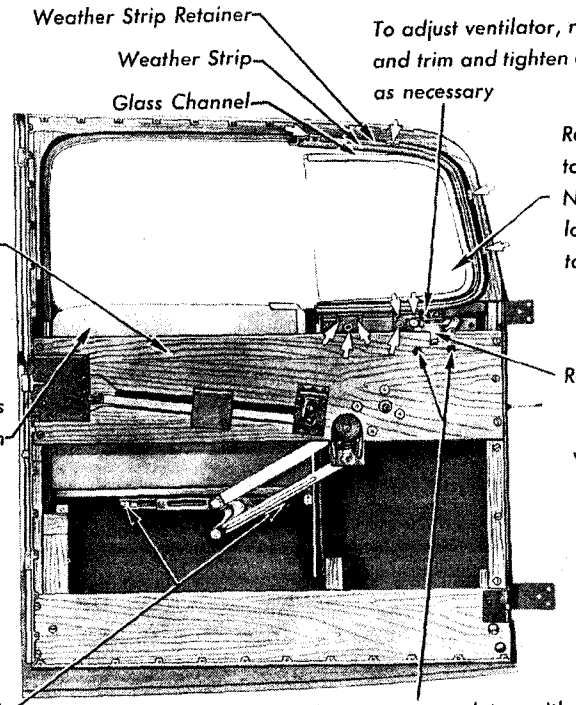


Fig. 1

First Type Front Door

with garnish moulding and trim removed

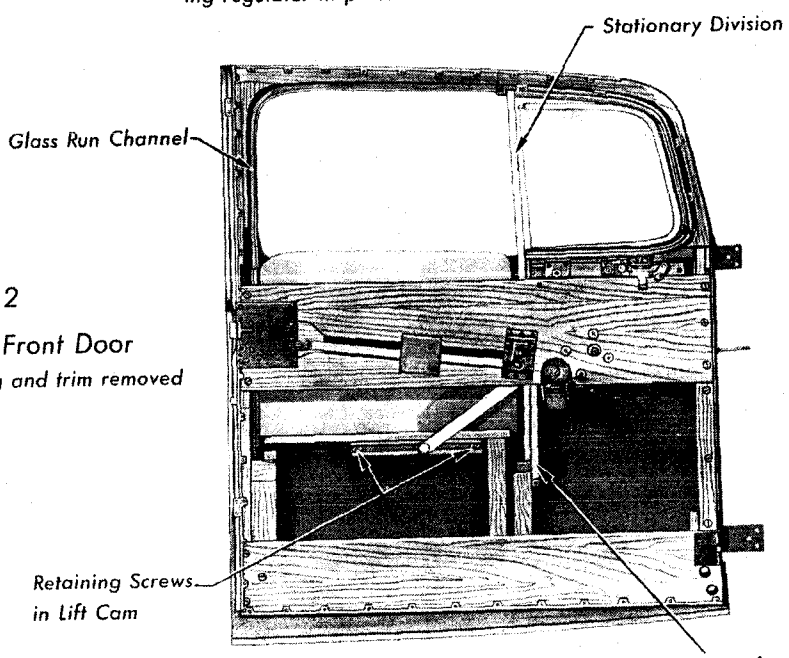


Fig. 2

Second Type Front Door

with garnish moulding and trim removed

Plate 7A. Front Door Details—"C" Series Cars

The removal of this type handle from the finishing panel is only a matter of straightening out or grinding off the lugs or removing the screws and pulling it out of the panel.

With the second type mounting the handle locks to the regulator control shaft with a small plunger located inside the hub. The removal of this type handle requires the use of the same special tool No. HMB-127 for releasing the lock plunger, as for the inside door handles.

16. Fastenings for Door Finishing Panels

The door finishing panels used on later "C" series Cadillac cars are held in place by two hangar plates in addition to the bayonet type fastenings used on earlier cars. These hangar plates are attached by means of screws to the rear face of the finishing panel and over the regulator board, and the screws holding the plates to this board must be removed to take out the panel. This construction assures against loosening.

In any case of the door finishing panel loosening up on early cars these hangars can be easily installed. The parts required for each panel are as follows:

No. Req.	Name	Part No.
2	Hangar plate	4038003
6	Screws	129186

17. Position of Door Handles

Attention should be given to the position of the various handles on the doors for the greatest convenience of the operator.

All handles should be placed so that they lock in the closed position on the downward swing. This gives the operator the most advantageous leverage in locking the ventilators to prevent leaks.

The door window regulator handles should be placed in such a position that they point away from the I. C. V. handle when the window is all the way up. This position affords more clearance between the ventilator handle and the window regulator handle when the window is all the way up or down.

18. Replacing Ventilator Assembly

The replacement of the ventilator assembly necessarily requires the removal of the old ventilator from the car and the installation of the new one. This necessitates the removal and installation of the garnish moulding, the belt finishing panel (on cars using finishing panels) and the trim. It is not necessary, however, to remove the trim panel entirely but merely to loosen it around the window and lock board, or regulator board as in the case of the rear quarter windows, and pull it away from the door or body far enough to provide easy access to the ventilator and board assemblies.

19. Replacing Door Ventilators

The removal and installation of the door ventilator and regulator assemblies are practically the same on all cars. There are, however, slight differences in operation between the first and second type front doors and also between the second type front doors and the rear doors. The removal and installation of these assemblies should be performed in the following way. See Plates 7A and 7B.

1. Remove garnish moulding. This includes the auxiliary moulding strip between the ventilator and the window glass on rear doors.

2. Remove belt finishing panel. (Cars provided with finishing panels.)

3. Remove ventilator control handle. (Cars not provided with belt finishing panels.)

4. Remove inside door handles.

5. Loosen trim around window and slightly below lock board and pull away from door far enough to make lock board accessible.

6. Remove filler board at top of lock board. (Front doors only.)

7. Remove nail in each end of rubber weather strip. (First type front doors only.)

8. Remove retaining screws in weather strip retainer (ten screws in front door and six in rear door). Screws are indicated by short arrows in Fig. 1.

9. Remove ventilator assembly by pulling out at the top and lifting up to disengage drive shaft from regulator.

10. Remove lock board, including corner blocks, and regulator.

The installation of the ventilator assemblies and regulators is accomplished in the opposite order of their removal.

When installing the first type front door ventilator assembly, be sure to install the metal clip at the top end of the weather strip and to nail both ends of the weather strip in place. Also seal the ventilator assembly in place with FS-745 rubber dough.

When installing the garnish moulding, it is necessary to work the lip or flange of the ventilator weather strip out over the garnish moulding. This is rather difficult to do without damaging the weather strip or moulding except by the use of a heavy string or cord. See Fig. 3, Plate 7B. To use the string, a knot is first tied in each end and the string then wrapped around the weather strip inside of the flange close to the retainer. The garnish moulding is next installed and pressed firmly against the weather strip. With the garnish moulding held in this position, the string is pulled out starting at one end, pulling the flange out over the garnish moulding. Care should be exercised to remove the string gently; otherwise the weather strip may be damaged.

20. Replacing Rear Quarter Window Ventilator

The removal and installation of the rear quarter window ventilators is practically the same as on the doors. The ventilator regulator, however, is more accessible as it is mounted on a small board which is easily removed. See Fig. 2, Plate 7B. The ventilator assembly and regulator are removed as follows:

1. Remove garnish moulding and belt finishing panel. (Cars provided with finishing panels.)

2. Remove ventilator control handle.

3. Loosen trim around window and regulator board directly below window.

4. Remove weather strip from vertical channel between ventilator and window glass, pulling it out from the center first.

5. Remove four retaining screws in weather strip retainer. Screws are indicated by short arrows.

6. Remove ventilator assembly by pulling out at top and lifting up to disengage drive shaft from regulator.

7. Remove regulator mounting board and take off regulator if necessary.

The regulator and ventilator assemblies are installed in the reverse order of their removal.

The ventilator assembly should be sealed in place with FS-745 rubber dough.

To install the weather strip between the ventilator glass and the window glass, install the ends first and then force the remainder of the strip in position, keeping the ends in line with those of the ventilator weather strip.

When installing the garnish moulding, the weather strip flange around both the ventilator and the window must be worked out over the moulding. This can be accomplished by using a heavy string in the same manner as on the front and rear door ventilators, as explained in Note 19.

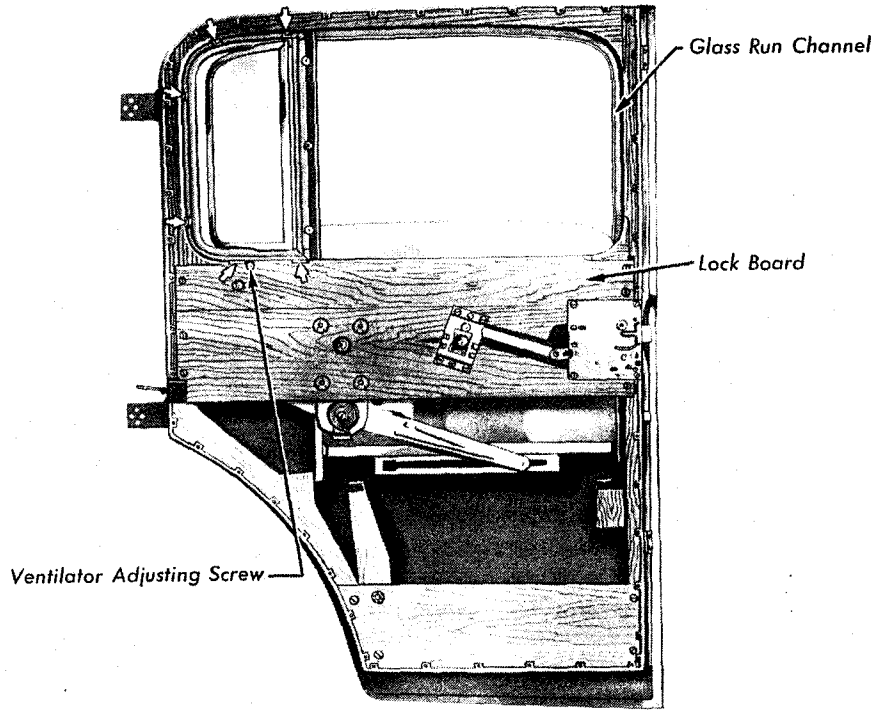


Fig. 1

Rear door with garnish moulding and trim removed

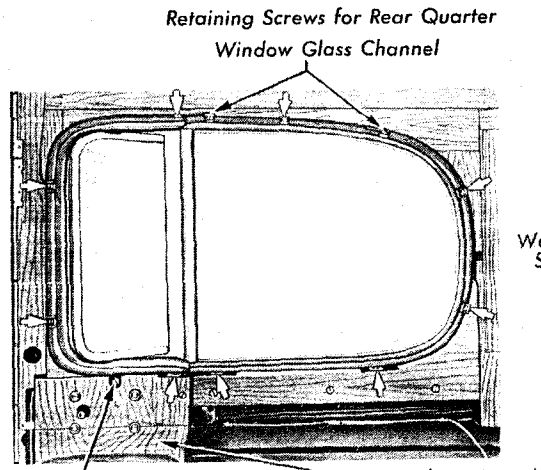


Fig. 2

Rear quarter window with garnish moulding and trim removed

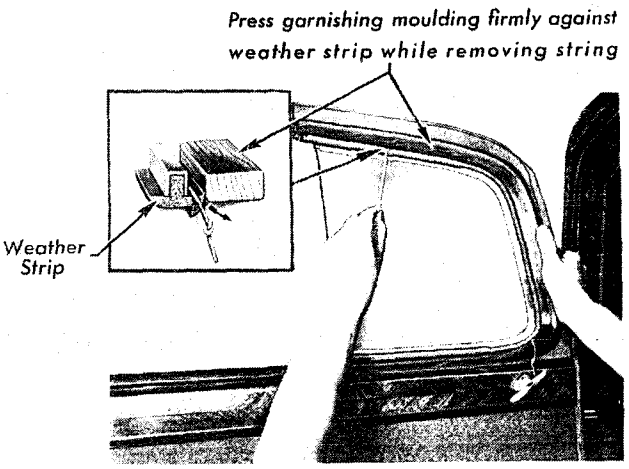


Fig. 3

When installing garnish moulding use string or cord to pull flange of weather strip out over moulding. Pull string gently to avoid damaging garnish moulding

Plate 7B. Rear Door and Rear Quarter Window Details—"C" Series Cars

BODY—Service Information

21. Replacing Window Glass

The construction of the door and body windows differ somewhat from each other, making it necessary to use a different procedure for removing and installing them. Their removal and installation, however, is not difficult when the proper procedure is known and followed.

The replacement of the window glass can be performed without disturbing the No-Draft ventilator assembly.

Front Door Windows

To remove the window glass from both the first and second type front doors, proceed as follows:

1. Remove garnish moulding, belt finishing panel and inside door handles, including the ventilator control handle.

2. Loosen trim around window and slightly below lock board filler board.

3. Remove filler board and lock pillar corner block at top of board.

4. Loosen trim at bottom of door just far enough up to reach the window lift cam (See Figs. 1 and 2, Plate 7A) at the lower edge of the glass with the glass in its lowest position. Removal of the trim entirely is not recommended as it would then be necessary to relocate the trim on the door when installing it.

5. Remove retaining screws in lift cam and pull cam slightly away from bracket on glass channel.

6. Remove first screw at lower end of glass run channel. (First type front doors only.)

7. Remove glass run channel from second type front doors; Also loosen vertical division channel at bottom end and swing out slightly to clear glass.

8. Raise glass all the way up out of the window opening, pulling the top edge out just enough to clear the door.

9. Remove metal channel from old glass for installation on new glass whenever the glass is to be replaced.

Install the front door glass in the opposite order of its removal. Install the garnish moulding as explained in Note 19.

Rear Door Windows

The removal and installation of the rear door window glass can be accomplished simply by removing the garnish moulding and the glass run channel, running the glass up and disengaging the glass channel from the window regulator operating arm.

If the glass is to be replaced, the metal channel should be removed from the old glass and installed on the new glass.

The glass is installed in the opposite way from its removal. The garnish moulding, however, should be installed as explained in Note 19.

Rear Quarter Windows

The rear quarter windows are stationary and their replacement is merely a matter of removing and installing the glass and channel assembly. The removal of the glass and channel assembly is accomplished by pulling it out of the window opening through the inside of the body after first removing the garnish moulding, loosening the trim around the window and removing the retaining screws in the glass channel. These screws are indicated by the short arrows in Fig. 2, Plate 7B.

The glass is installed in the reverse order of its removal except that the glass channel should be sealed in place with FS-745 rubber dough. The garnish moulding should also be installed as explained in Note 19.

Back Window

The back window glass and channel assembly is retained in place by the garnish moulding which is installed under pressure. To remove the glass, therefore, it is simply a matter of removing the garnish moulding after turning the retaining screws all the way out, and pulling the window and channel assembly out towards the front of the car. Before doing this be sure to remove the rear seat cushion to avoid damaging it.

The glass channel should be removed from the old glass for installation on the new glass whenever the glass is to be replaced.

When installing the rear window glass and channel assembly seal it in place with No. 60 more-tite bedding putty. Also make sure that the rubber weather strip showing outside of the car is even all around the window opening. Any uneveness can be corrected by shimming on the inside. The garnish moulding is then installed and pressed firmly against the glass while fastening it in place.

Tool, Part No. B-177, should be used to press the garnish moulding firmly in place while installing the retaining screws. Care should be taken when using this tool not to exert too much pressure against the pillar posts as they may be sprung, preventing the doors from closing properly.

22. Replacing Windshield Glass

The windshield is of the solid, non-adjustable type on all closed bodies. The glass is carried in a rubber weather strip which is held in place by the garnish moulding. The windshield glass is removed as follows:

1. Remove garnish moulding. (Do not disturb lower panel on top rear face of instrument board.)

2. Remove metal clips on pillars, which hold windshield glass in place.

3. Pull top of glass back to clear header board and lift out of lower weather strip.

The windshield glass is installed in the following manner:

1. Place a little vaseline on the lower edge of the glass and install it in the lower weather strip.

Additional help may be required to enter the glass in the weather strip channel as it is necessary to open the channel from both sides of the glass with screw drivers or some other form of flat tool.

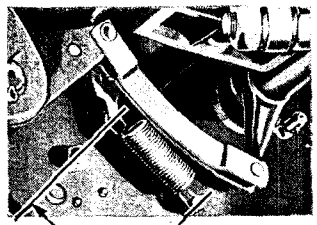
2. Push top of glass forward into position and install metal clips to keep it in place.

3. Seal lower right and left corners of windshield where cutouts are made for wiper tube and aerial lead-in wire. To do this plug the openings with cotton, pressing it firmly in place. Also pack some additional cotton in back of the weather stripping for about two inches up from the lower edge of the glass. Then coat the cotton with FS-745 rubber dough. It is also advisable to seal the windshield glass in position by coating the front side and edges of the glass channel with rubber dough.

4. Install garnish moulding.

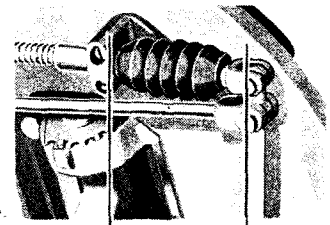
In order to make the windshield leak-proof, the garnish moulding must be pressed firmly against the weather strip while fastening it in place. This can be accomplished by using tool, Part No. B-177 braced against the front side of the door. Too much pressure should not be applied against the garnish moulding as it might damage the moulding or the pillars or break the glass.

Plate 8. Brake Connections and Adjustments



4-1/16 in.
All models

Note: Adjustment of connections, when necessary, should precede adjustment of cams. Make all adjustments of connections in released position.



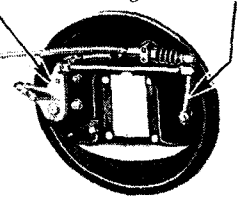
3-11/16 in. All models

Disconnect pull rod and assister from pedal to make complete brake adjustment.

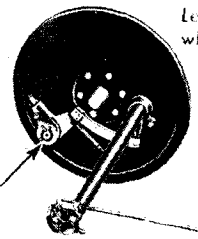
Adjust cable rods to give correct position of front brake cam levers.

Determine correct position of cam lever by control lever dimension given above.

Lever and shaft must be against stops when adjusting brake connections.

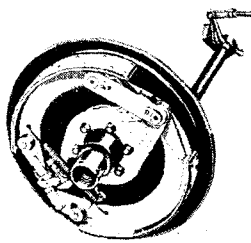


Determine correct position of cam lever by dimension given above.



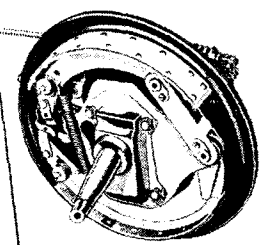
Pull rod should be connected to lower hole.

Adjust pull rod and stop screw to give 1/4—3/8 in. clearance between pedal and toe board, keeping assister tube on 370-B and 452-B within dimensions given on Plate 9.



Adjust rods to give correct position of rear brake cam levers.

Adjust rod to give 1/16—1/8 in. free travel between pawl and stop.



Give cup three turns per greasing and refill every 1,000 miles. Too much grease is liable to get into assister housing and cause rubber diaphragm to deteriorate rapidly.

Check pull rod adjustment by slightly depressing and releasing brake pedal. There must be 5/32—3/16 in. movement at bottom of valve lever with pedal lever stationary.

When relining brakes, back off cam nuts before readjusting.

Cadillac 370-B brake system illustrated
Cadillac 452-B same except diameter of brakes
Cadillac 355-B and LaSalle 345-B same except that no brake assister is used.

BRAKES

General Description

Cadillac-LaSalle brakes are of the internal type with two self-energizing shoes on each of the four brakes. The floating or upper brake shoes are energized with the forward motion of the car. For this reason they do most of the braking and are made of alluminum alloy. The anchored or lower shoes are energized with the backward movement of the car. Therefore, they do less braking and are made of steel.

The aluminum alloy shoes naturally expand more than the steel shoes under the heat generated by the use of the brakes. This compensates for the tendency of the drums to expand away from the shoes. The result is that Cadillac brakes are just as effective toward the bottom of a long hill as they are when first applied at the top.

The cam operating the shoes, is mounted on a pivoted bracket so as to be self-centralizing and thereby compensate for unequal wear on the brake linings.

The cam end of each brake shoe has a pivoted link which rests against the brake operating cam.. Thus, instead of a sliding contact between the cam and the brake shoes, there is a rolling contact between the cam and the pivoted links. This construction prevents wear on the cam and the ends of the brake shoes.

The cam has a splined shaft on which is mounted an especially designed operating lever. The hub of this lever is broached to fit over the splined shaft and is connected to the casing of the cam lever by an adjustable link. When the nut on the outer end of the link is turned, the hub turns with relation to the lever itself, thereby changing the position of the brake operating cam. This construction permits the simplest known method of brake adjustment.

The front brakes are operated by a cable extending through the frame side bars to the brake assembly on the wheels. This cable is carried in a reinforced, flexible casing or conduit, and is connected at the rear to a short pull rod which in turn is connected to a lever on the rocker shaft.

The foot pedal operates the brakes on four wheels, while the hand brake lever operates the rear brakes only. Thus only one set of shoes is needed for both braking systems.

The service operations and adjustments of the brakes are the same on all cars except the 370-B and 452-B cars. The only difference is that these cars are equipped with a vacuum brake assister.

VACUUM BRAKE ASSISTER

A vacuum brake assister is used on the 370-B and 452-B cars. It is connected at the rear to the center cross member of the frame, and at the front end to a lever on the pedal shaft and is operated by vacuum from the intake manifolds. The force thus developed is applied to the lever on the pedal shaft, and is added to the force applied by the driver to the pedal. Although the assister is connected to the brake pedal, it does not interfere with the pedal action, and the foot brakes can be applied whether the engine is running or not. Also, the assister does not affect the adjustments of the brakes or any of the brake connections up to the pedal.

The control is positive, the valves being regulated by the movement of the pedal itself. The assister develops power only while the brake pedal is moving forward. As soon as the pedal stops, the assister ceases to build up any force and merely helps to hold the position which has been reached. The assister releases automatically when the pedal is released.

The general design of the brake assister and the various stages of its operation are shown on Page 26.

Service Information

1. Regrinding Brake Drums

Cast-iron brake drums supplied by the Parts Division, for all model cars with the shoe type brakes, are finish-machined at the Factory before being shipped. This eliminates the necessity of finish-machining the drum after installing it on the wheel. Careful alignment of the drum on the hub, however, is of particular importance.

There is a limit to the amount of metal that can safely be removed from a drum when regrinding. The drums must not be ground out more than .030 inch over the original limit of the inside diameter. When brake drums are too thin, the excessive heat that frequently develops will cause them to distort and warp. Also the enlarged inner diameter of the drum may prevent proper action of the cams.

Note: Disconnect brake pull rod and assister from pedal lever to adjust eccentric bushing.

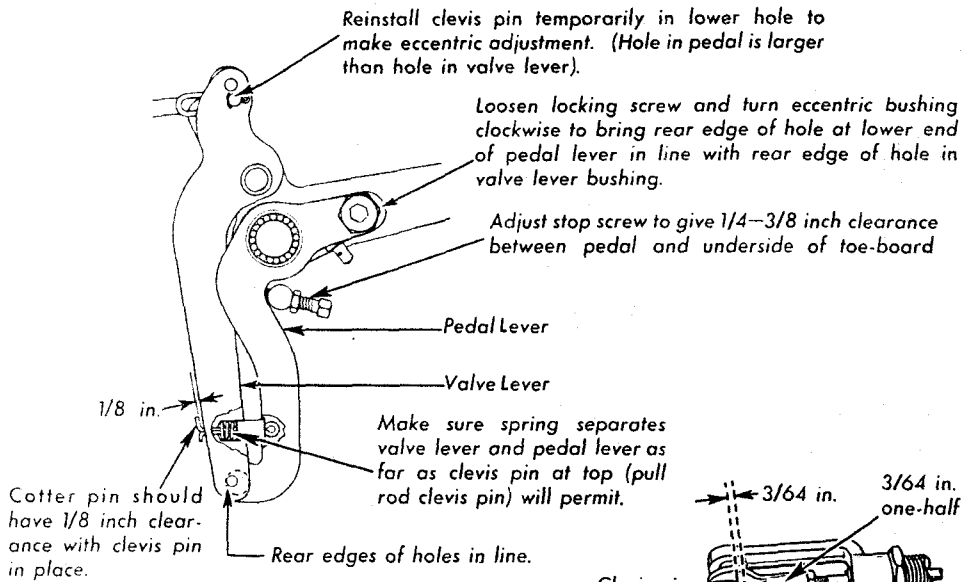
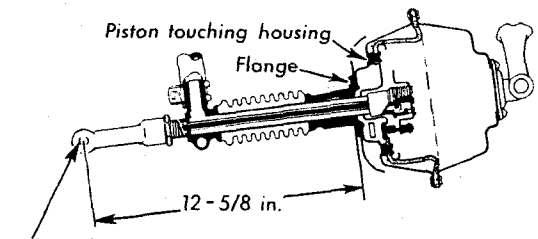


Fig. 1
Eccentric Bushing Adjustment



Adjust clevis so pin can be put in clevis and lever without turning clevis.

Fig. 2
Operating Tube Clevis Adjustment

Proper adjustment of valve rod is necessary to insure clearance between piston and front of cylinder.

Fig. 3
Valve Rod Adjustment

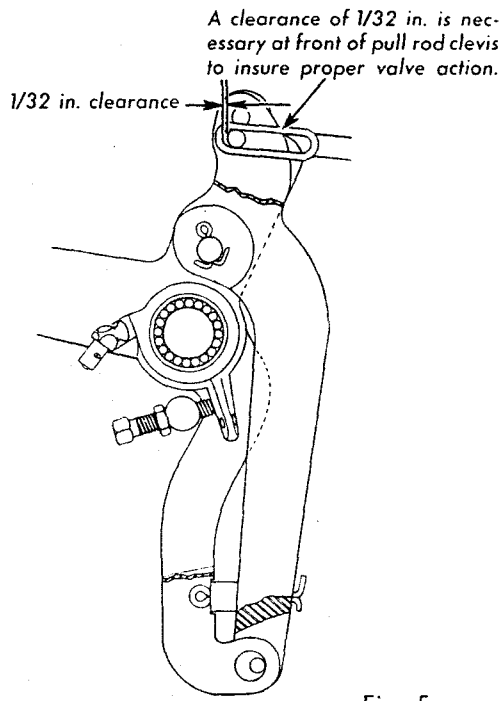


Fig. 5
Pull Rod Adjustment

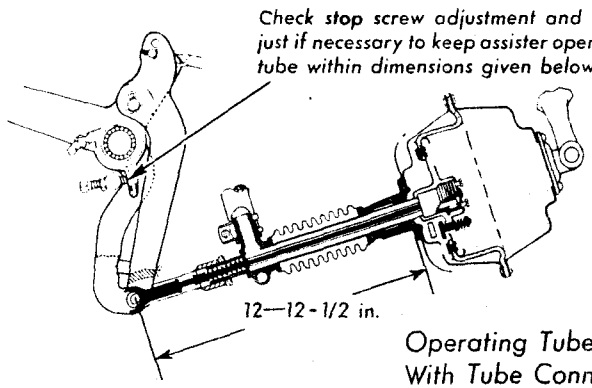


Fig. 4
Operating Tube Adjustment
With Tube Connected to Pedal

Plate 9. Brake Assister Adjustments—Cadillac 370-B and 452-B

BRAKES—Service Information—Specifications

The thickness of the drums may be measured either in the groove near the outer flange or at the thin section back of the reinforcement. The table gives the minimum thickness at both points, "at groove" representing the thickness within the groove, and at thin section back of reinforcement representing the thickness of the drum on the side of the reinforcement nearest to the wheel.

2. Snapping Noise in Diaphragm of Brake Assister

The rubber diaphragm in the assister sometimes makes a snapping noise when the brake pedal is operated. This noise is due to the diaphragm being twisted, and results from the clevis on the operating tube not being properly lined up before it is connected to the pedal lever.

If the clevis on the tube does not line up so that the pin can be inserted without turning the tube, the lock nut should be loosened and the clevis readjusted. Since the rubber diaphragm is all that holds the tube, it is easy to turn the tube to line up the clevis, but if this is done, the diaphragm will be twisted and cause the snapping noise referred to.

It is not necessary to disconnect the assister to correct this. Simply loosen the lock nut at the clevis and turn the tube slightly, by means of the vacuum connection, until the proper alignment is secured.

3. Leaking Atmospheric Valves

If the atmospheric valves do not seat tightly, part of the effect of the vacuum is lost and the assister will not exert the normal amount of force. To test for this condition, first note how much pressure must be applied to the brake pedal to make a given stop with the transmission in neutral and the engine idling. Then repeat the test with the transmission in neutral but with the ignition switched off.

If there is no difference in the pedal pressure between the two tests, then the assister is not functioning properly.

In such cases, the groove cut in the shank of the atmospheric valve for the rubber washer which forms the seat, may have a burr or fin which prevents the washer from entering the groove and causes it to buckle. This can be corrected by removing the burr and making sure that the washer fits all the way in the groove and lies flat on the inner face of the valve.

4. Chatter or Jerking on Brake Assister

Chattering or jerky operation of the brake assister is generally caused by misalignment of the assister with the brake pedal, or by improper action of the atmospheric valves.

Misalignment of the assister is usually encountered only after installing a new assister and very rarely gives any trouble on assisters installed at the factory.

To check the alignment, take the pin out of the clevis at the front of the operating tube and hold the front end of the assister just below the pedal levers. The alignment between the clevis and the pedal lever should be such that the clevis can be pushed up into place without striking the levers.

If the above test shows that the assister is not in proper alignment, remove the assister and file off the sides of the lug on the back of the cylinder to secure proper alignment. In many instances, proper alignment may be secured by simply filing out the sides of the pin hole in this lug.

If the brake assister appears to be in correct alignment with the pedal, take the assister apart and install new atmospheric valves, Part No. 881475.

Specifications

Subject and Remarks	LaSalle	Cadillac		
	345-B	355-B	370-B	452-B
Braking area (foot brakes)—total in square inches	238	238	238	274.6
Braking power division	60% front 40% rear	60% front 40% rear	60% front 40% rear	60% front 40% rear
Clearance between lining and drum (approximately) *Clearance secured by turning adjusting nut on cam lever*	.007"	.007"	.007"	.007"
Clearance between pedal and under side of toe-board	¼-⅜"	¼-⅜"	¼-⅜"	¼-⅜"
Drums (See Note 1)—				
Inside diameter	14.996-15.004"	14.996-15.004"	14.996-15.004"	15.996-16.004"
Out of round, not over	.007"	.007"	.007"	.007"
Thickness at thin section	.488-.554"	.488-.554"	.488-.554"	.488-.554"
Lining— *Full moulded lining used on rear brakes and semi-moulded on front brakes.*				
Length per wheel	29¾"	29¾"	29¾"	31⅝"
Thickness	3/16"	3/16"	3/16"	3/16"
Width	2"	2"	2"	2¼"
Pull back (lever retracting) springs (front and rear brakes)—				
Free length inside loops (approximately)	3¾"	3¾"	3¾"	3¾"
Tension in pounds stretched to 4½ in. between loops	10-12 lbs.	10-12 lbs.	10-12 lbs.	10-12 lbs.
Type	Mechanical	Mechanical	Mechanical with Vacuum Assister	Mechanical with Vacuum Assister

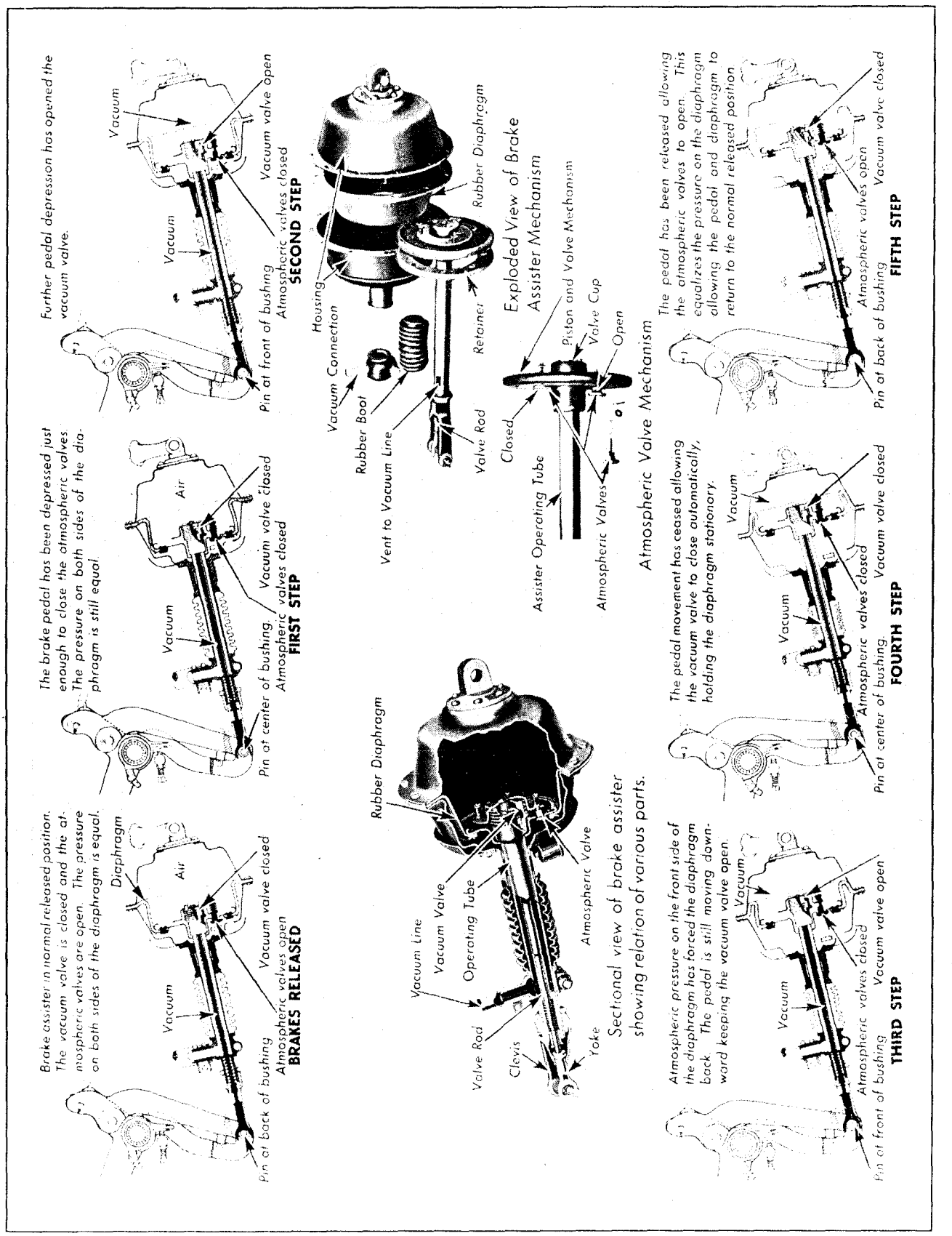


Plate 10. Diagrams Showing Operation of Vacuum Brake Assister—Cadillac 370-B and 452-B

BRAKES

Note: Unless brake connections are known to be O.K. check them as shown in Plate 8 before proceeding with cam adjustments.

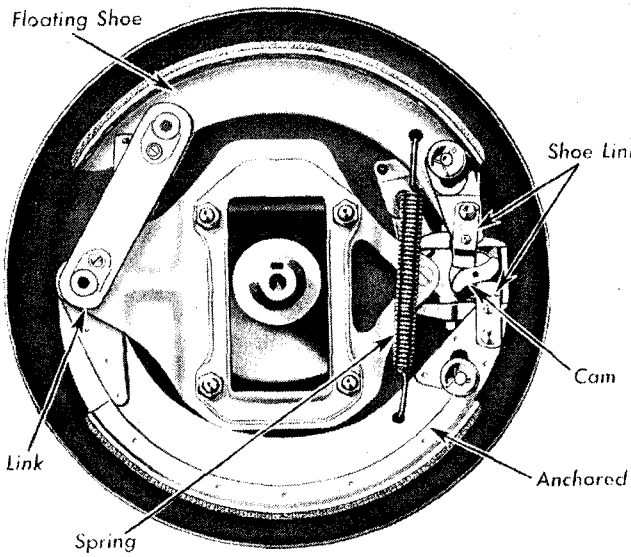


Fig. 1
Typical Front Brake

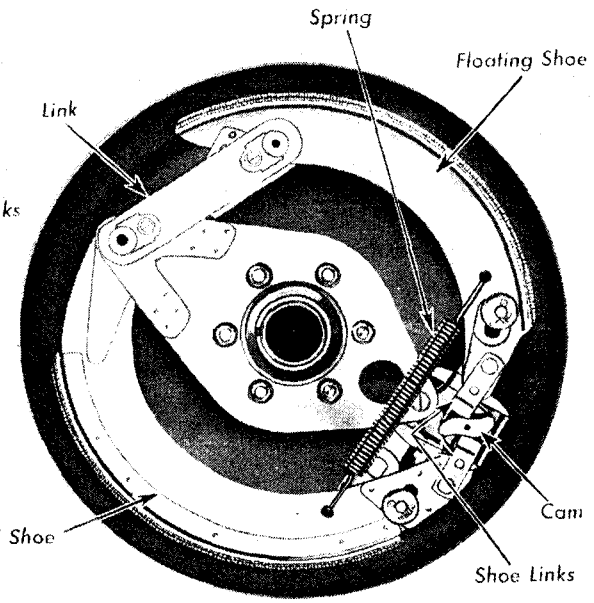
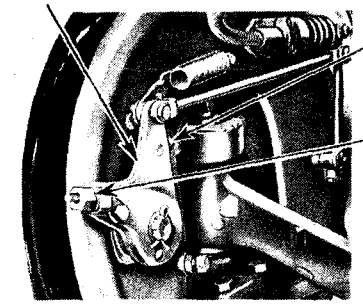


Fig. 2
Typical Rear Brake



Loosen cam bracket locking nut and apply brakes firmly to centralize cam bracket. Tighten nut before releasing brakes.

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 brakes 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. 3
Front Brake Adjustment

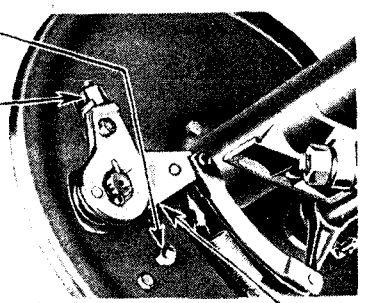


Fig. 4
Rear Brake Adjustment

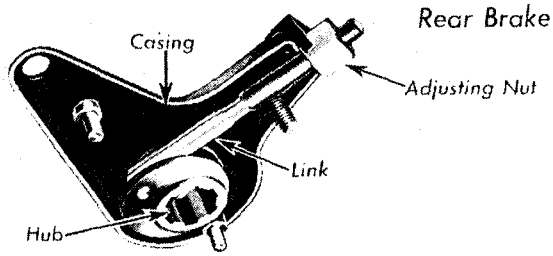


Fig. 5
Cam Lever With Half of Casing Removed

Plate 11. Brake Details and Adjustments

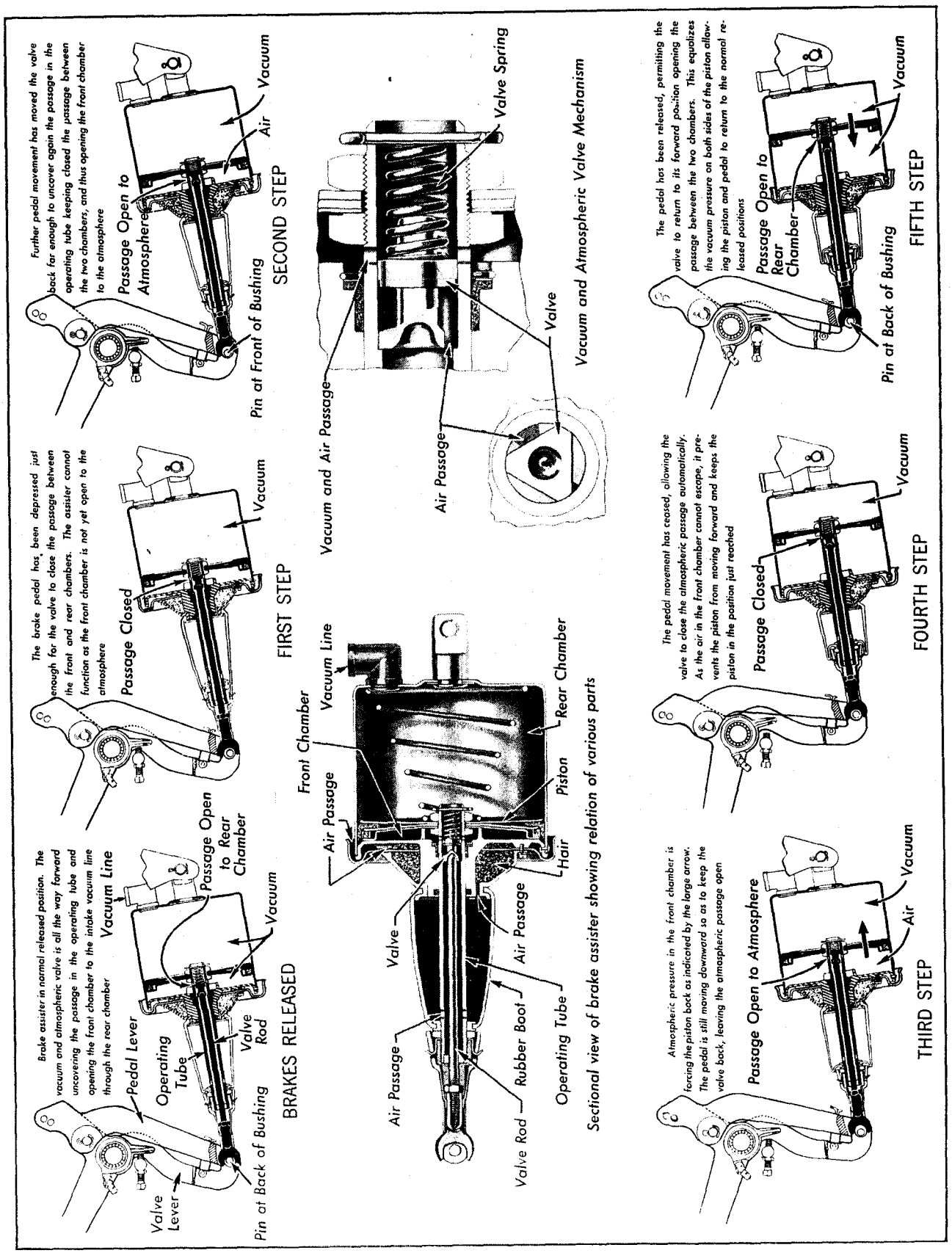


Plate 11A. Diagrams Showing Operation of Vacuum Brake Assister—Cadillac 355-C—LaSalle 345-C

BRAKES—General Description—Service Information

General Description

The brakes on the "C" series cars are the same as on the corresponding "B" cars with the exception that a brake assister is used on the Cadillac 355-C and the LaSalle 345-C.

A coil spring also surrounds each brake drum on all "C" cars to give additional cooling surface and to absorb any noise produced by vibration in the drum.

Because of a difference in the length of the operating tube, the 355-C assister unit is not interchangeable with that used on the 345-C.

Aside from the brake assister on the 355-C and 345-C cars, all adjustments of the brakes and brake connections remain the same as on the "B" cars.

Service Information

5. Lubrication of Brake Assister

Early V-12 and V-16 cars are provided with a ratchet type grease cup for lubricating the brake assister. With this ratchet type grease cup, lubrication is necessary every 1000 miles.

To lubricate the assister, simply fill the grease cup with light cup grease (G-2½) and turn down a few turns every 1000 miles. It is extremely important that the G-2½ cup grease be used during cold weather. When wheel bearing lubricant is used at this point, difficulty is sometimes experienced in extremely cold weather with the lubricant hardening and interfering with the smooth operation of the assister.

Later cars are equipped with a wick oiler for lubricating the brake assister. With this type oiler the lubrication requirements are different, an engine oil of S. A. E. viscosity 20 being required every 6000 miles.

This new type wick oiler, part No. 885268 can be used on any 370 and 452 brake assister. To install, simply remove the grease cup and screw the oiler in place, tightening the hex securely. The brake assister pull rod should be removed and cleaned of all the old grease. After reassembling, the oiler reservoir should be filled with S. A. E. 20 engine oil and screwed in place. Lubrication is then required only on the regular number 6 and 12 lubrication operations.

The brake assister on the 345-C and 355-C cars requires the same lubrication as the clutch power cylinder on the "B" models. That is, one ounce of S. A. E. No. 10 oil or light machine oil of weight similar to shock absorber oil should be injected in the front chamber of the cylinder through the plugged opening in the cylinder head every 6000 miles.

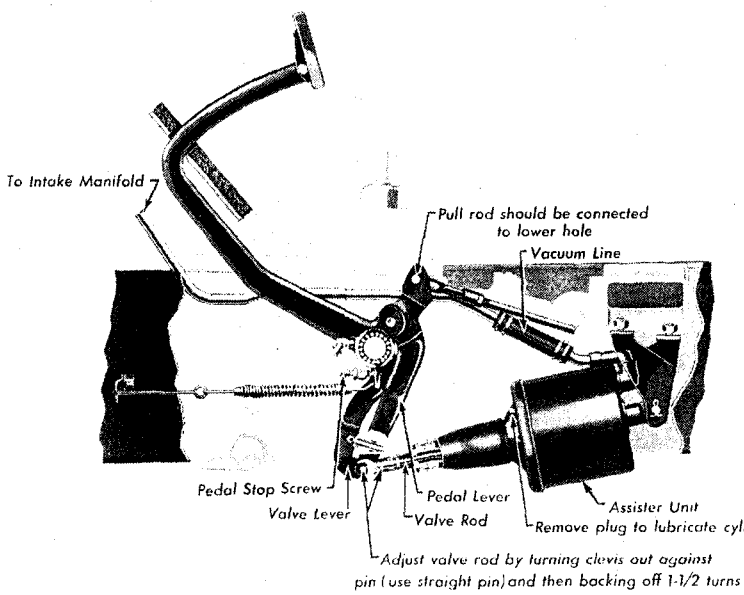


Fig. 1
Brake Assister Connections

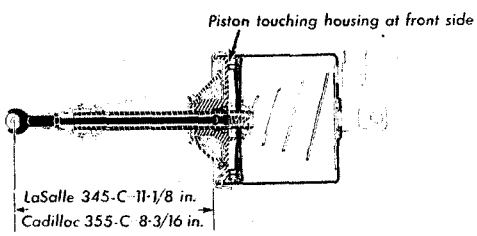


Fig. 2
Operating Tube Adjustment

Plate 11B. Brake Assister Adjustments—Cadillac 355-C—LaSalle 345-C

CLUTCH

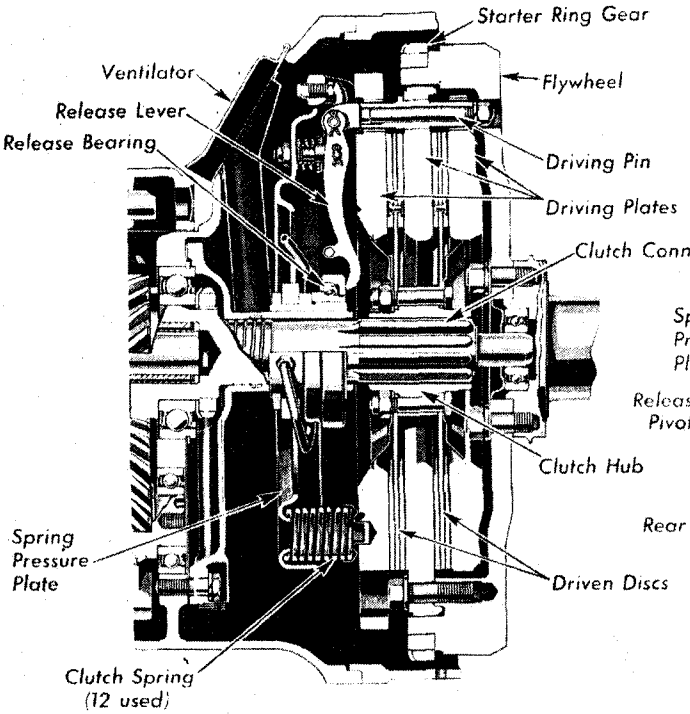


Fig. 1

Sectional View of Cadillac 355-B Clutch and Flywheel. Typical of all models.

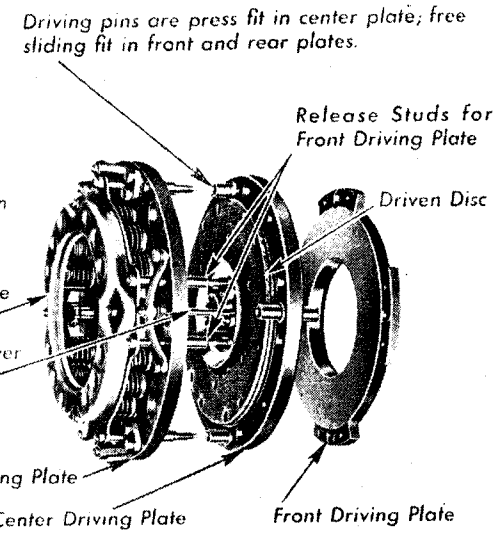


Fig. 2

Clutch Disassembled

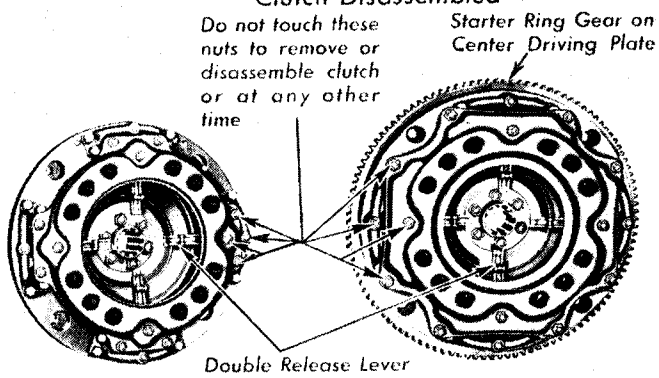


Fig. 3

Rear view of clutch showing double-lever release mechanism.

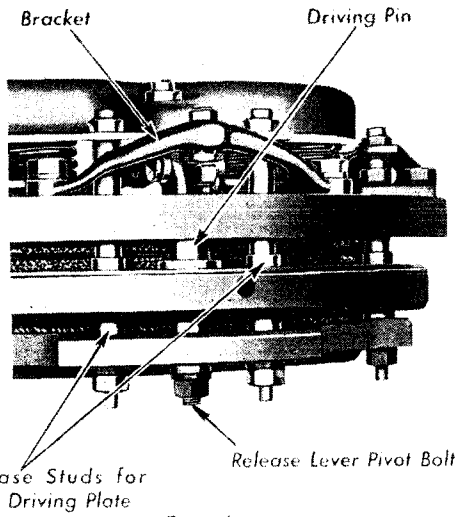


Fig. 4

View of Clutch Release Mechanism

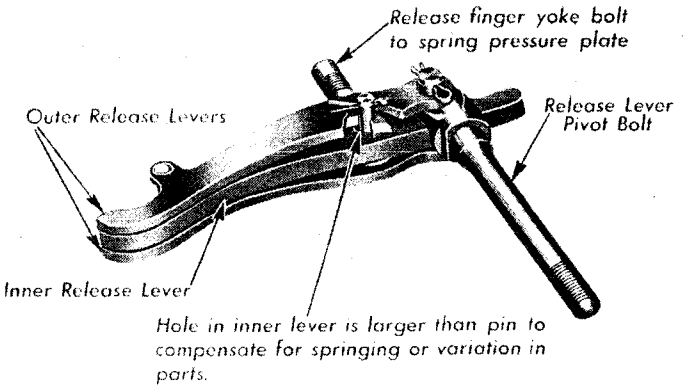


Fig. 5

Clutch Release Lever Assembly

Plate 12. Clutch Details

CLUTCH

General Description

The clutch used on Cadillac and LaSalle cars is of the dry-plate type with three driving plates and two driven discs. The center driving plate carries four driving studs which extend through both the front and rear plates.

The rear plate is a part of the spring pressure plate assembly which also includes the double-lever release mechanism. This double-lever control compensates for springiness in the levers and pressure plate, insuring uniform engagement of the clutch over the entire surface of the facings.

The driven discs for the 345-B, 355-B and 370-B clutches have curved spokes to give the same flexibility as the larger discs with the longer straight spokes used in the 452-B clutch.

The factory does not supply any of the component parts of the various pressure plate assemblies, inasmuch as specially designed equipment is necessary to adjust the assembly properly. The only individual parts furnished for the clutch are the driven discs. When any of the other parts need replacing, it will be necessary to install a complete clutch assembly.

The mounting of the clutch is extremely simple. It is necessary to take off only four nuts to remove the entire clutch assembly from the flywheel.

The clutch pedal stop screw is located above the pedal hub instead of below as on previous models. With this type stop any wear or backlash in the trunnion pin does not affect the movement of the clutch pedal pad. Therefore, the amount of pedal play represents only the movement of the clutch release bearing.

The service operations of the clutch and the adjustments of the clutch control are the same on all cars.

CONTROLLED FREE WHEELING

All cars are equipped with "controlled" free wheeling. This is the name given to the automatic vacuum-operated control for the clutch. This device consists of a piston and cylinder connected to the clutch release mechanism and operated by the vacuum from the intake manifold. The vacuum is controlled through valves connected to a control button on the toe-board and to the accelerator pedal. The design is such as to vary the rate of engagement of the clutch according to the speed with which the accelerator pedal is depressed.

The relative positions of the clutch control parts is shown in Plate 14, Page 32. The vacuum or power cylinder is attached at the rear end to the center cross member of the frame and the piston is connected to the clutch release mechanism. The power cylinder is connected through a control valve to the intake manifold, which furnishes the necessary vacuum. The force thus developed is applied to a lever which is connected to the clutch release rod for disengaging the clutch. Although the power cylinder is connected to the clutch release mechanism, it does not interfere with the pedal action and the clutch can be operated entirely independently of the automatic control.

POWER CYLINDER

The power cylinder has a piston which divides the housing into two chambers. The front, or air chamber, is open to the atmosphere through three passages: (1) the air by-pass in the piston rod, (2) the atmospheric valve in the cylinder head and (3) the bleeder line leading to the bleeder valve in the control valve unit. The rear, or vacuum chamber, is connected to the intake manifold through the cut-out and accelerator plunger valves in the control valve.

The air by-pass in the piston rod is simply a long slot. Its operation is controlled by the movement of the piston and permits a rapid discharge of air from the air chamber when the piston is moving forward up to the point at which the clutch begins to engage. After this point is reached the only escape for air from the air chamber is through the bleeder valve.

The atmospheric valve in the cylinder head permits a rapid refilling of the air chamber in the cylinder when the clutch is disengaged.

CONTROL VALVE

The control valve consists of three plungers: the bleeder plunger, the accelerator plunger and the cut-out plunger. The bleeder and accelerator plungers are connected together to the accelerator pedal. The cut-out plunger is operated by the control button.

The control is positive, the valves being actuated by the movement of the control button and the accelerator pedal. The power cylinder develops power only so long as the driver keeps the control button depressed. As soon as the

CLUTCH

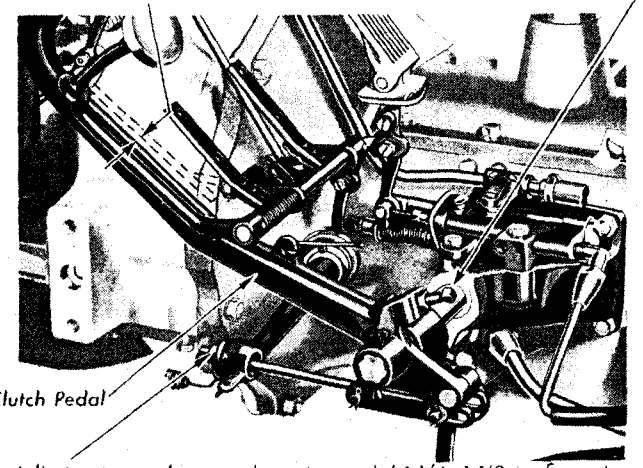


Fig. 1
Typical Clutch Control

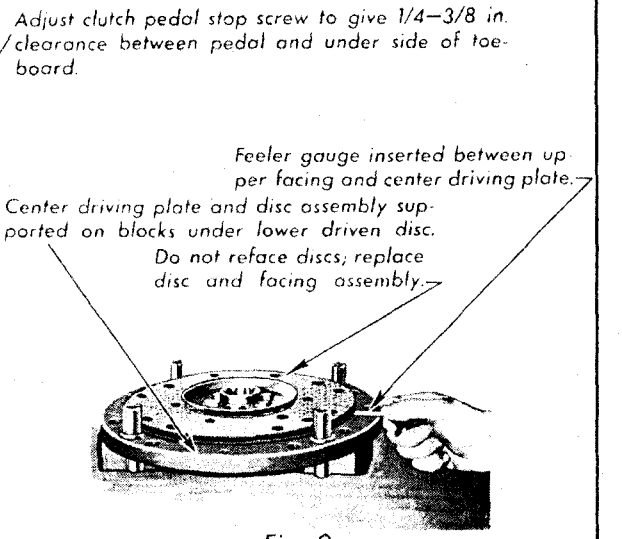


Fig. 2
Measuring total clearance between clutch facings and center driving plate. This total clearance should be held to .025—.040 in., .030 in. being recommended.

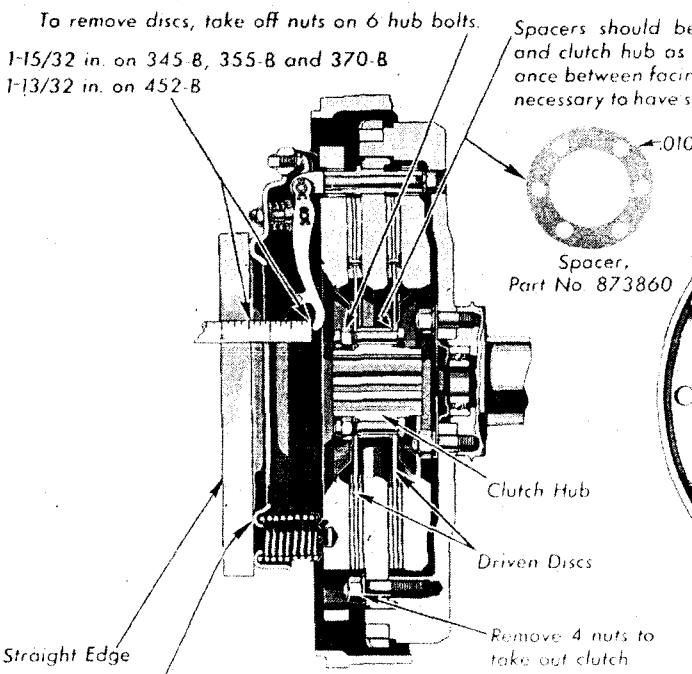


Fig. 3
Replace driven discs if distance between outer end of release levers and plane of rear face on spring pressure plate is less than the amount given on the illustration.

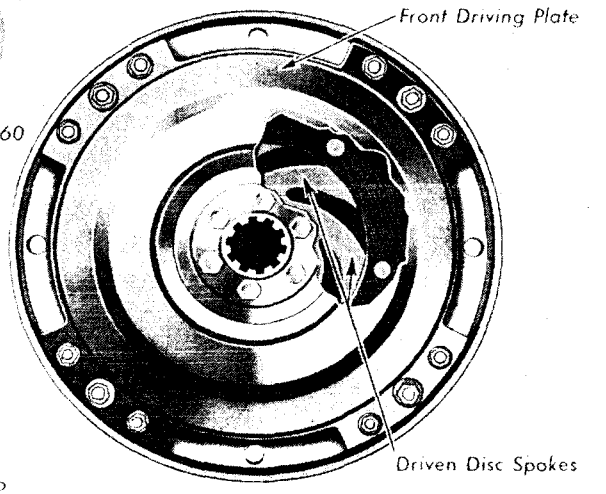


Fig. 4
Driven discs with curved spokes must be properly installed. The spokes should lead out from the hub in a clockwise direction when viewed from the flywheel side of the clutch.

Plate 13. Adjustment of Clutch Pedal Control and Driven Disc Details

driver releases this button the vacuum operated control does not function and the clutch can be operated in the conventional way with the clutch pedal.

The bleeder plunger regulates the flow of air out of the air chamber of the power cylinder after the air by-pass in the piston rod is closed, just as the clutch starts to engage. The amount of air bled out of the power cylinder at this time depends on the number of bleeder holes uncovered by the bleeder plunger and the speed of the plunger movement, the position and movement of which, in turn, depends on the position and movement of the accelerator pedal.

Therefore, a slow downward movement of the accelerator pedal permits a slow escape of air from the air chamber in the power cylinder and gives a correspondingly slow engagement of the clutch. A faster downward movement of the accelerator pedal will uncover the bleeder holes faster, permitting a more rapid escape of air from the air chamber in the power cylinder and consequently, a quicker clutch engagement. Thus the rapidity with which the clutch is engaged is controlled by the movement of the accelerator pedal, insuring smooth clutch engagement under all conditions.

The accelerator pedal must not be pushed down while the control button is depressed, until the car is to be started. This means that the accelerator pedal cannot be used to speed up the engine while waiting for traffic. If the engine is not warm enough to run at normal idling speed, the hand throttle should be advanced or the regular clutch pedal should be used until the engine is warm.

While the accelerator plunger moves with the bleeder plunger, it functions in conjunction with the cut-out plunger to open the vacuum chamber in the power cylinder to the intake manifold or to the atmosphere. Each of these plungers acts both as a valve and an air by-pass.

When the control button is depressed with the accelerator in the released position, the valve ports in both the accelerator and cut-out plungers are in line, completing the vacuum passage between the intake manifold and the power cylinder. The vacuum then pulls the piston back and disengages the clutch.

Depressing the accelerator (with the control button down) closes the vacuum line and opens the vacuum chamber to the atmosphere, permitting the chamber to refill as the clutch is engaged.

Releasing the accelerator (with the control button down) opens the vacuum line again and disengages the clutch.

The accelerator pedal must be completely released between shifts. It is the first half-inch of travel of the accelerator pedal that operates the clutch control valve and unless the accelerator pedal is allowed to come all the way back, the clutch will not automatically disengage.

Releasing the control button likewise closes the vacuum line and opens the vacuum chamber to the atmosphere, allowing the clutch to engage.

Service Information

1. Mounting of Clutch Control Mechanism

The hook-up of the free-wheeling control button and the accelerator pedal requires the pivoting of the bell-cranks on the toe and floor board. The toe-board is in one section and, since the control button is attached to this unit, it should not be moved unless absolutely necessary. The floor board, however, is in two sections. The accelerator pedal control is pivoted to the large right-hand section, but the panel at the extreme left-hand side may be removed without affecting any adjustment. If the sections to which these units are attached are moved the controls will require readjustment.

2. Removal of Transmission

Extreme care must be taken when removing the transmission 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.

3. Vent Holes in Control Valve Boot

On some of the first cars shipped, the rubber boot, Part No. 891917, protecting the clutch control valves does not have holes in it to allow the proper passage of air for venting the vacuum chamber when the clutch is being engaged.

On cars now being shipped, the boot has three ¼-inch holes in the lower side of the boot.

Without these holes, the engagement of the clutch is delayed. In case of improper action of the clutch control, the rubber boot should be inspected to make sure it has these holes before any adjustments are changed.

Plate 14. Power Clutch Control Adjustments

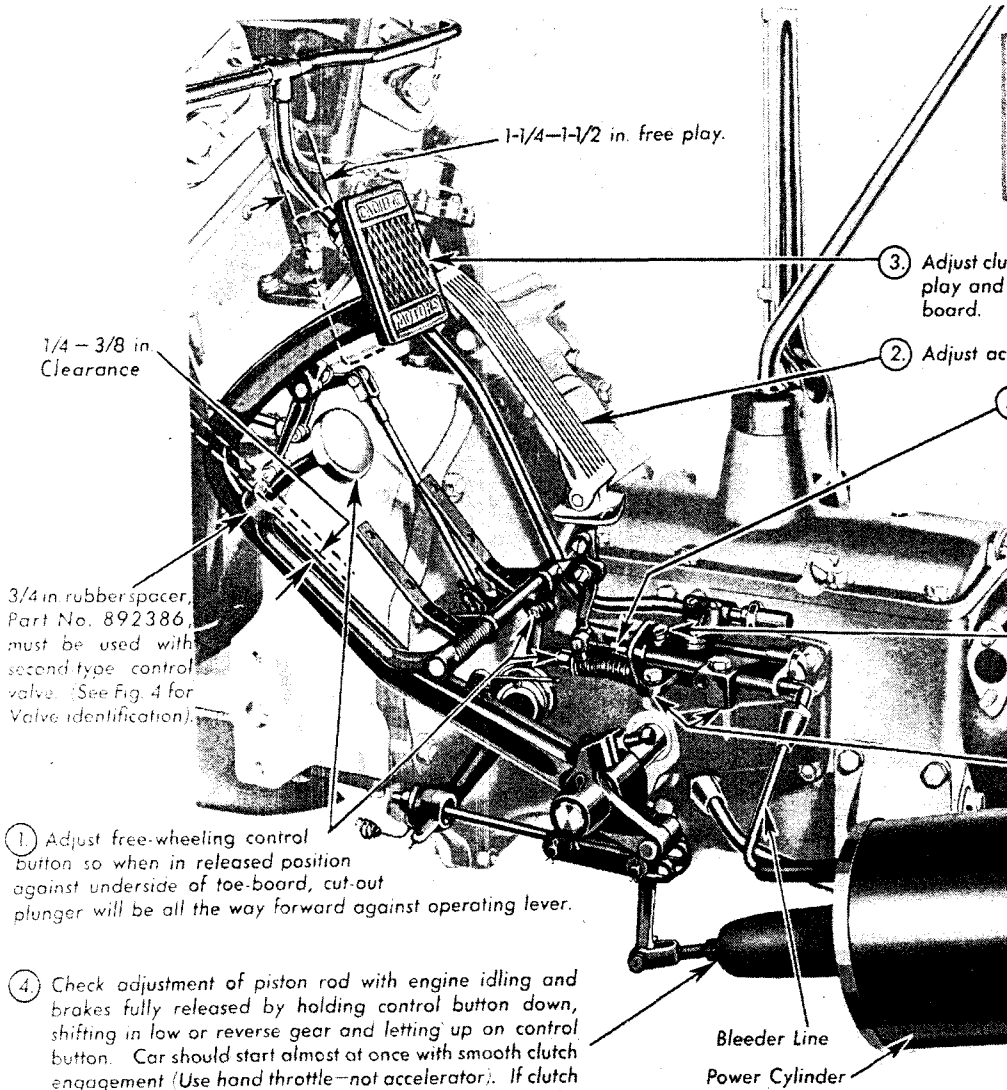


Fig. 1
General Arrangement and Adjustments of Free-wheeling Control Units

Plate 15. Accelerator Pedal Adjustment and Power Cylinder and Control Valve Details

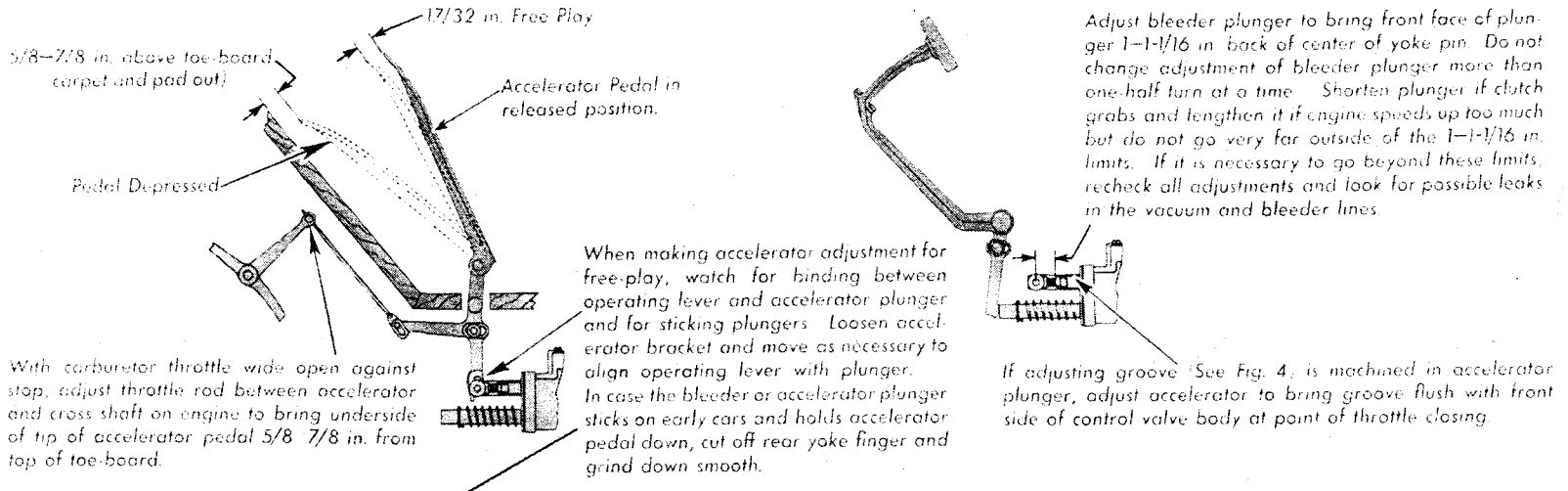


Fig. 2
Accelerator and Bleeder Plunger Adjustments

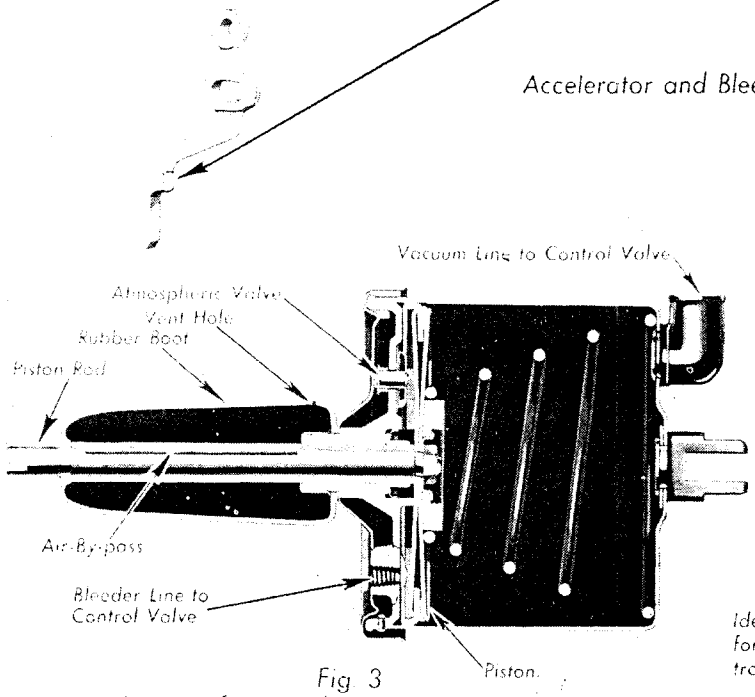


Fig. 3
Sectional View of Free-wheeling Control Power Cylinder

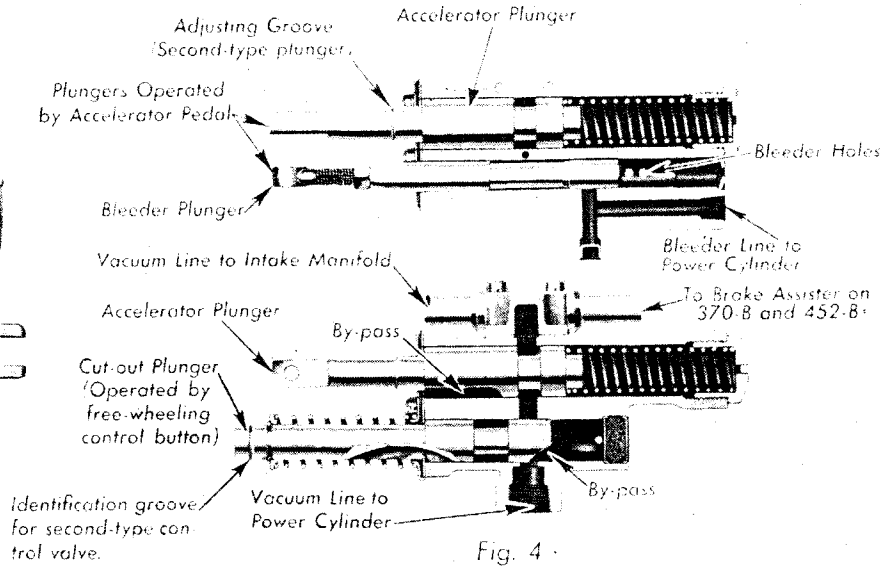


Fig. 4
Sectional Views of Free-wheeling Control Valve

Plate 16. Diagrams Showing Operation of Power Clutch Control

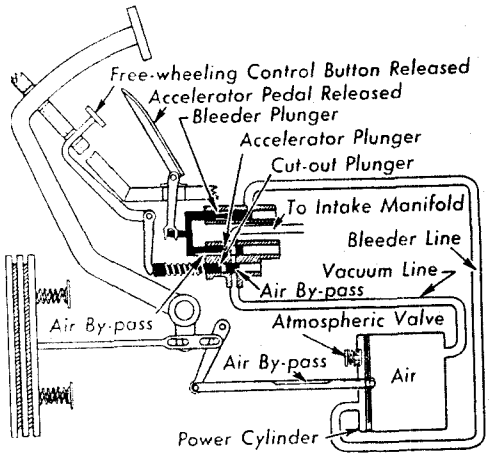


Fig. 1

Clutch Engaged

Control button and accelerator are released.

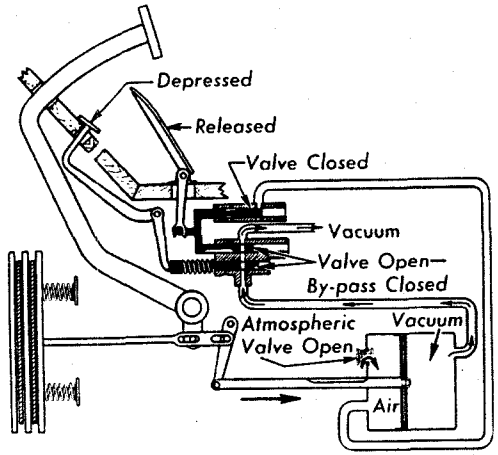


Fig. 2

Clutch Disengaging

Control button is depressed, opening vacuum line.

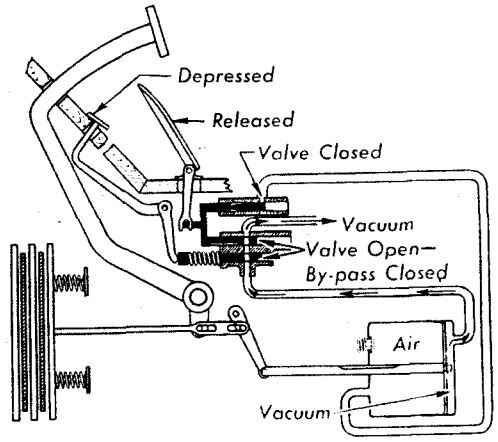


Fig. 3

Clutch Disengaged

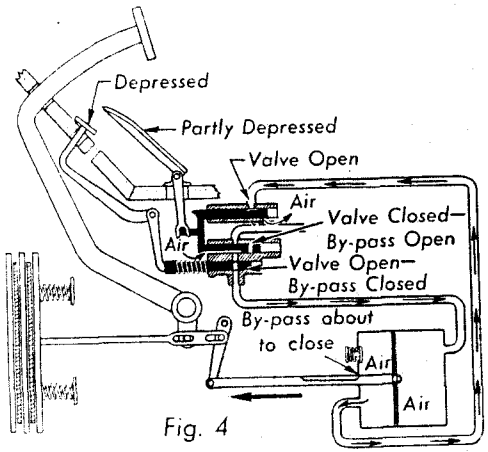


Fig. 4

Clutch Engaging

Accelerator is partly depressed, closing vacuum line and opening bleeder line.

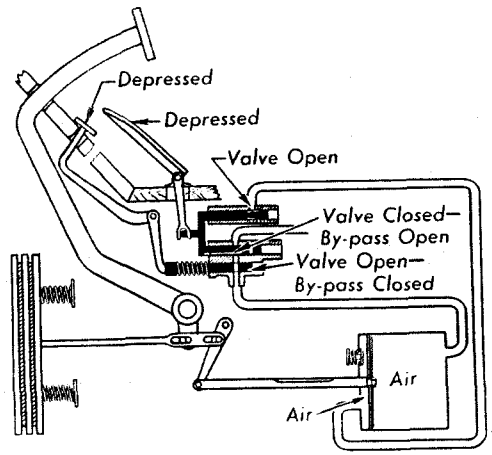


Fig. 5

Clutch Engaged

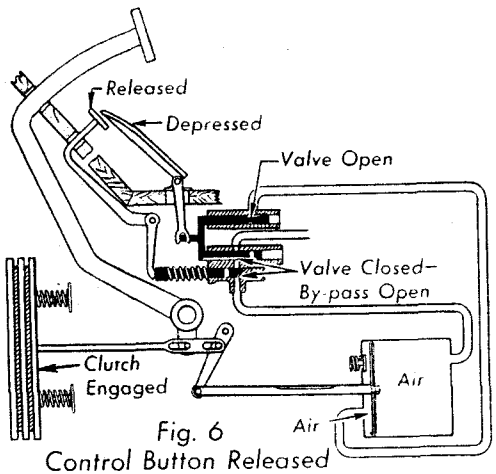


Fig. 6

Control Button Released

Both chambers in power cylinder are open to the atmosphere and movement of the accelerator has no effect on the operation of the clutch.

CLUTCH—Service Information—Specifications

4. Installation of Second Type Clutch on Early 452-C Cars

A second type clutch and flywheel are used on 452-C cars beginning with engine unit 50-24. The change made in the clutch is the removal of the starter ring gear from the clutch center plate to the flywheel, which construction is similar to that used on the V-8 and V-12 cars. The part number of this second type clutch is 3500109 and that of the flywheel is 1096192.

This second type clutch is furnished for replacement on all 452 cars, the "A" and "B" series as well as the "C" series. Installation on all except 452-C cars after engine unit 50-23 will also necessitate the installation of the second type flywheel with starter gear.

As the flywheels supplied under part number 1096192 are for use on "A" and "B" as well as "C" series cars, they are stamped with two sets of ignition timing marks. These marks can be readily identified, however, as the IG/A mark for the "A" and "B" cars is 1¼ inches ahead of center, whereas the IG/A mark for the "C" series is ½ inch ahead of center. The IG/A marks can be further identified by the stampings "A and B model" and "C model" respectively.

5. Clutch Balance

Before a clutch leaves the factory, it is properly balanced and each of the three plates are marked in line so that the plates can be lined up without rebalancing any time the clutch is disassembled. The marking consists of a circle in which a letter may appear. If the circles on each of the three plates are lined up whenever the clutch is reassembled after disassembly, there should be no difficulty experienced of an out of balance condition.

Specifications

Subject and Remarks	LaSalle	Cadillac		
	345-B	355-B	370-B	452-B
Clearance between—				
Driving plates and driving pins				
New limits	.002-.0045"	.002-.0045"	.002-.0045"	.002-.0045"
Worn limit, not over	.008"	.008"	.008"	.008"
Hub and splines on clutch connection shaft				
New limits	.0005-.002"	.0005-.002"	.0005-.002"	.0005-.002"
Worn limit, not over	.005"	.005"	.005"	.005"
Release bearing sleeve and extension on transmission bearing cap				
New limits	.001-.004"	.001-.004"	.001-.004"	.001-.004"
Worn limit, not over	.006"	.006"	.006"	.006"
Pedal and bottom of toe-board	¼-⅜"	¼-⅜"	¼-⅜"	¼-⅜"
Disc facings—				
Area—total in square inches	219.1	219.1	219.1	243.3
Diameter inside	5½"	5½"	5½"	6½"
Diameter outside	10"	10"	10"	10 15/16"
Number used	4	4	4	4
Thickness	.135-.145"	.135-.145"	.135-.145"	.135-.145"
Driven disc with facings—				
Number used	2	2	2	2
Thickness				
New limits	.325-.350"	.325-.350"	.325-.350"	.335-.360"
Worn limit, not over	.260"	.260"	.260"	.260"
Driving plates, number of	3	3	3	3
Mounting of clutch control mechanism (See Note 1)	.....	.....	.....	.....
Pedal (clutch) free play	1¼-1½"	1¼-1½"	1¼-1½"	1¼-1½"
Pressure springs, number of	12	12	12	12
Removal of transmission (See Note 2)	.....	.....	.....	.....
Spring, retracting for clutch pedal—				
Free length inside loops	6¼"	6¼"	6¼"	6¼"
Tension in pounds stretched to 10¾ in. between loops	34 to 38	34 to 38	34 to 38	34 to 38
Type	Plate	Plate	Plate	Plate
Vent holes in control valve boot (See Note 3)	.....	.....	.....	.....

COOLING SYSTEM

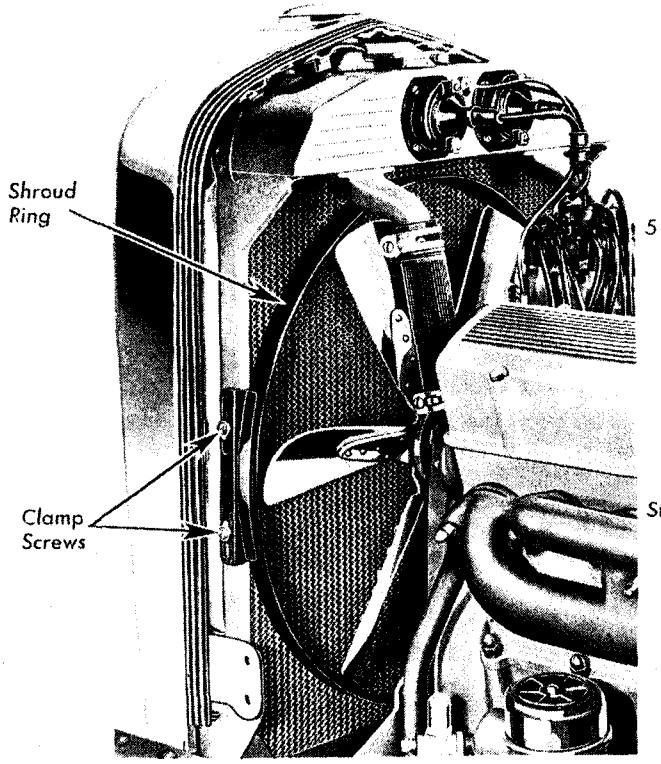


Fig. 1
The shroud ring should be raised or lowered whenever the fan belt is adjusted to keep the fan centered in the ring.

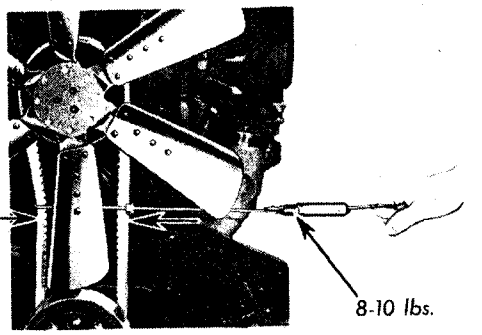


Fig. 2
The fan belt should be adjusted so a pull of 8-10 lbs. is necessary to bring outer faces of belt within 5 in. of each other—Cadillac 370-B, 452-B.

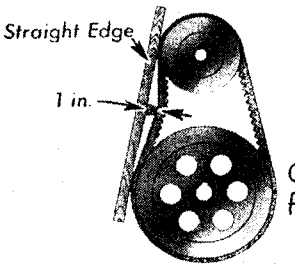
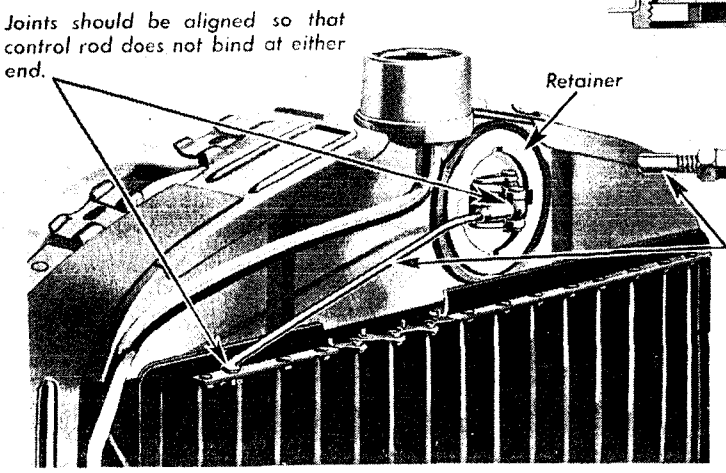


Fig. 3
Correct adjustment of fan belt—Cadillac 355-B -LaSalle 345-B



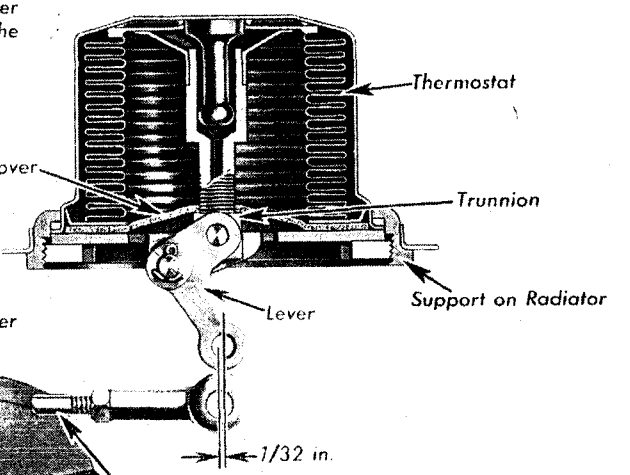


Fig. 4
Front view of radiator showing thermostat and shutter control.

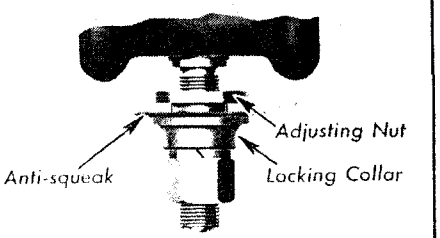


Fig. 5
Radiator Support

Plate 17. Cooling System Details

COOLING SYSTEM

General Description

The general arrangement of the cooling system on the LaSalle and Cadillac 8 differs somewhat from that of the 12- and 16-cylinder cars.

On the LaSalle and Cadillac 8, the fan revolves on "Durex" bearings lubricated with oil from the oil pressure regulator. The passage for the oil return is through the hollow fan bracket. On the 370-B and 452-B cars, the fan is carried on ball bearings, which are lubricated by hand through a fitting at the rear end of the fanshaft.

The fan runs within an adjustable shroud ring installed on the radiator as shown in Fig. 1, Plate 17. This ring prevents the recirculation of air under the hood, thus increasing the flow of air through the radiator.

A "built-in" chromium plated grille is used in front of the radiator and is a part of the radiator casing. It adds greatly to the appearance of the car and is easily cleaned. The radiator is of the "full-bonded fin" construction.

The 370-B and 452-B cars are provided with condenser tanks in the cooling system. These tanks are located on the right-hand frame side bar and are connected to the radiator overflow pipe. It is necessary, of course, to have all water connections, as well as the radiator cap, perfectly tight in order that the condenser tank may operate satisfactorily.

The condenser tank is not standard equipment on LaSalle and Cadillac 8, but can be installed if desired.

The water pump used on the 8-cylinder engines is of the single outlet type, and is mounted on the front of the timing chain case, while that on the 370-B and 452-B engines is of the double outlet type, and is mounted on the right-hand side of the crankcase, back of the generator. On this pump, one outlet leads to each cylinder block.

The water pump on the 370-B and 452-B cars is driven from the rear end of the generator through a short shaft having a flexible coupling at each end.

Service Information

1. Radiator Filling Level

The recommended level to which the Cadillac 355-B and LaSalle radiators should be filled is approximately half-way to the top of the upper tank or one-half way up on the thermostat bulb. It is especially important not to fill the radiator too full in the winter, because expansion will cause a loss of anti-freeze solution through the overflow.

2. Flushing Cooling System

The cooling system should be flushed out every 6000 miles to prevent the excessive accumulation of sediment and scale. Disconnect lower hose from radiator and attach flushing hose to radiator outlet. The water pressure for this flushing operation should not exceed 20 to 25 pounds or the radiator may be damaged. The flushing should be continued until water runs clean from the lower hose connection.

3. Using Soluble Oil in Cooling System

The use of water soluble oil in the cooling system is recommended as an aid in keeping the system clean by reducing sludge and retarding rust formation.

When soluble oil has not previously been used in the cooling system of a Cadillac or LaSalle car, about ½ pint should be used. If the oil has been used previously, upon draining and refilling, ⅓ of a pint (six ounces) is sufficient to keep the cooling system in good condition.

When soluble oil is first used in the system, a thin protective film is deposited over the cooling surfaces. Any excess oil mixes with the cooling liquid and, although a slight amount has a tendency to prevent foaming by increasing the surface tension of the liquid, too much will result in violent foaming with consequent loss of cooling liquid.

Before adding soluble oil to cars already in service, the cooling system should be thoroughly cleaned and flushed. Soluble oil itself is merely a preventive; its cleaning properties are negligible. With the cooling system clean, the soluble oil will have a chance to do its work; otherwise the formation of rust, although retarded to some extent, will continue under the scale already formed.

It is not necessary to add soluble oil each time water is added. The 6 ounces added after the cooling system has been drained and flushed is sufficient until the next draining.

Soluble oil has no anti-freeze qualities in itself but it will blend satisfactorily with any approved anti-freeze. The same proportions of anti-freeze should be maintained with or without the use of the oil.

Important—Hydrometer readings are affected by the soluble oil and allowances must be made for the difference. If an alcohol or methanol solution is used its freezing temperature will be five degrees higher than indicated by the hydrometer. For instance, if the hydrometer reading indicates 0° F. the corrected reading would be 5° above zero. In the case of a glycerine or ethylene glycol solution, however, the five degrees should be subtracted making the solution good to 5° below when the hydrometer indicates 0° F.

4. Test for Radiator Thermostat

To test the thermostat, immerse it in water of the correct temperature. Do not permit the water to enter the thermostat or come in contact with its inner surface. The plunger should start to move at not less than 149° and should finish its stroke ($\frac{13}{32}$ in.) at not over 173°.

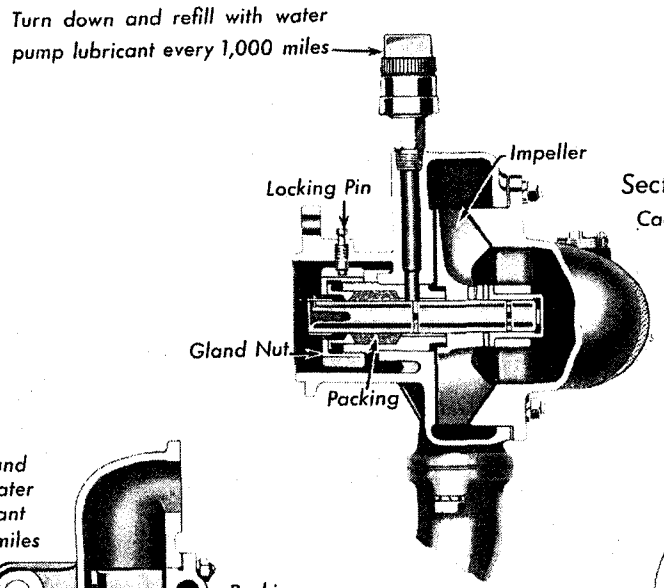


Fig. 1

Sectional View of Water Pump—

Cadillac 355-B-C LaSalle 345-B-C

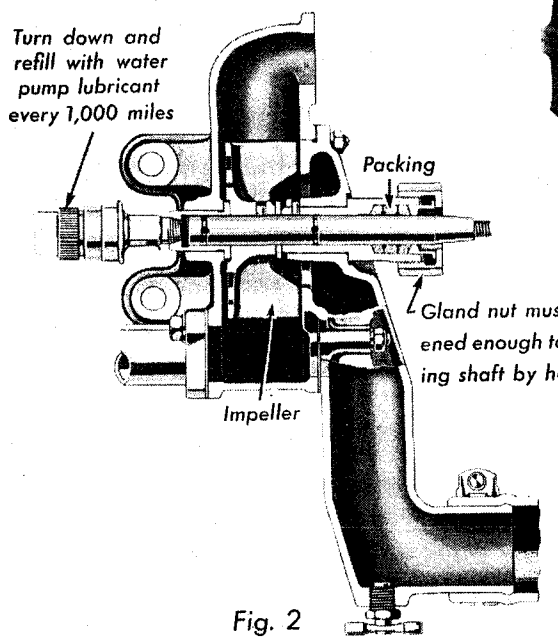


Fig. 2

Sectional View of Water Pump—

Cadillac 370-B, 370-C before engine unit 40-301, 452-B

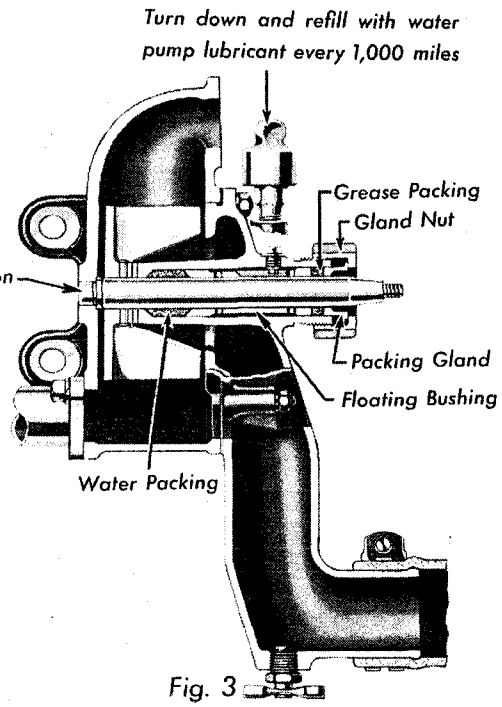


Fig. 3

Sectional View of Water Pump

Cadillac 370-C beginning engine unit 40-301, 452-C

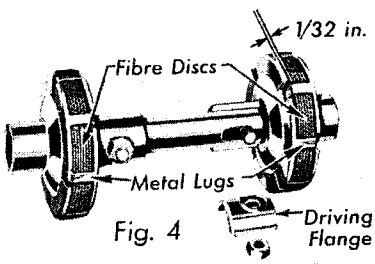


Fig. 4

Cadillac 370-B-C Water Pump Drive

Typical of 452-B-C

Fibre disc couplings should have at least 1/32 in. total play or clearance endwise between discs and driving flanges. Water pump should be lined up to give equal clearance at all points between fibre discs and driving flange

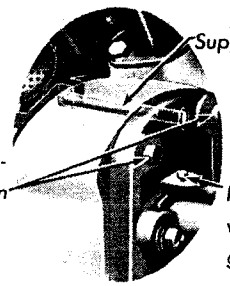


Fig. 5

Water Pump Mounting—

Cadillac 355-B-C LaSalle 345-B-C

Plate 18. Water Pump Details and Drive Adjustment

COOLING SYSTEM—Specifications

Subject and Remarks	LaSalle	Cadillac		
	345-B	355-B	370-B	452-B
Fan				
Belt—				
Length (center to center)	8½″	8½″	14″	14″
Width	⅞″	⅞″	⅞″	⅞″
Blades—				
Pitch at tip of blade (spiral blades)	31°	31°	31°	31°
Number used	6	6	6	6
Diameter	20¾″	20¾″	20¾″	20¾″
Ratio of fan R.P.M. to engine R.P.M.	9/10 to 1	9/10 to 1	9/10 to 1	9/10 to 1
Hose Connections				
Cylinder to radiator (top), (2 used)—				
Diameter, inside	1¼″	1¼″	1¼″	1¼″
Length	13¼″	13¼″	7¼″	7¼″
Cylinder to elbow (2 used)—				
Diameter, inside	2¼″	2¼″	.....	.....
Length	1¼″	1¼″	.....	.....
Elbow to pump—				
Diameter, inside	1⅝″	1⅝″	.....	.....
Length	16⅝″	16⅝″	.....	.....
Pump to radiator (two used on 370-B, 452-B)				
Diameter, inside	1⅞″	1⅞″	1¾″	1¾″
Length	10⅜″	10⅜″	4″	4″
Radiator				
Anti-freeze solution—				
Alcohol or methanol required for 10° F.	9.25 qts.	9.25 qts.	8.50 qts.	10 qts.
Specific gravity at 60° F.				
Alcohol—denatured No. 5	.967	.967	.967	.967
Methanol	.972	.972	.972	.972
% by volume	35	35	35	35
Alcohol or methanol required for 0° F	10 qts.	10 qts.	9.25 qts.	10.75 qts.
Specific gravity at 60° F.				
Alcohol—denatured No. 5	.957	.957	.957	.957
Methanol	.964	.964	.964	.964
% by volume	38	38	38	38
Alcohol or methanol required for —10° F.	11.75 qts.	11.75 qts.	10.75 qts.	12.75 qts.
Specific gravity at 60° F.				
Alcohol—denatured No. 5	.948	.948	.948	.948
Methanol	.957	.957	.957	.957
% by volume	45	45	45	45
Alcohol or methanol required for —20° F.	13.25 qts.	13.25 qts.	12.25 qts.	14.25 qts.
Specific gravity at 60° F.				
Alcohol—denatured No. 5	.935	.935	.935	.935
Methanol	.950	.950	.950	.950
% by volume	51	51	51	51
Alcohol or methanol required for —30° F.	15 qts.	15 qts.	13.75 qts.	16 qts.
Specific gravity at 60° F.				
Alcohol—denatured No. 5	.926	.926	.926	.926
Methanol	.944	.944	.944	.944
% by volume	57	57	57	57
This table is based on use of 188 proof denatured alcohol or of anti-freeze methanol 155 proof.				
Area of radiator core in square inches	483	483	483	519
Capacity of cooling system (See Note 1)	6½ gal.	6½ gal.	6 gal.	7 gal.
Flushing cooling system (See Note 2)	.....	.....	.....	.....
Manufacturer's number, location of	.....	.....	.....	.....
Rear of lower tank on R. H. side				
Soluble oil in cooling system, Using (See Note 3)	.....	.....	.....	.....
Thermostatic Shutter Control (See Note 4)	.....	.....	.....	.....
Water Pump				
Clearances between—				
Impeller and pump body				
New limits	.055-.070″	.055-.070″	.070-.085″	.070-.085″
Worn limit, not over	.080″	.080″	.095″	.095″
Pump shaft and bushings				
New limits	.001-.003″	.001-.003″	.001-.003″	.001-.003″
Worn limit, not over	.005″	.005″	.005″	.005″
End play in pump shaft				
New limits	.....	.....	.0065-.025″	.0065-.025″
Worn limit, not over	.....	.....	.050″	.050″

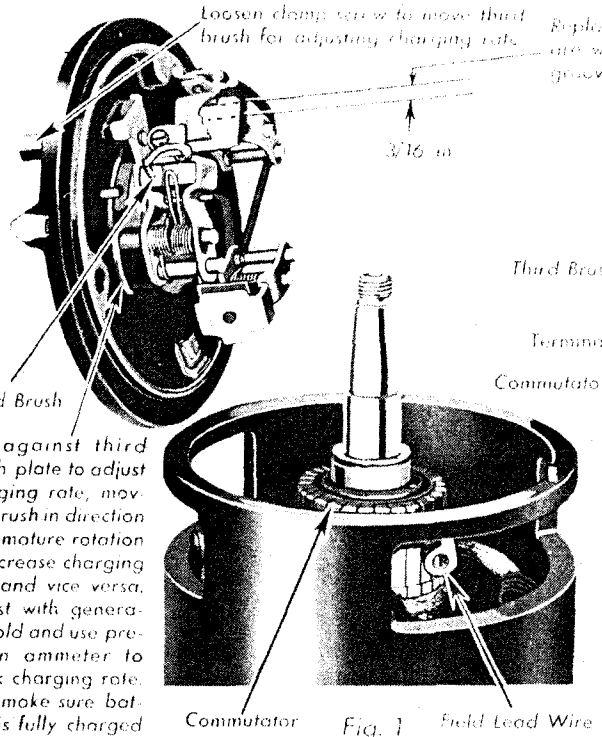


Fig. 1
Commutator end of generator with end frame removed. Typical of all models.

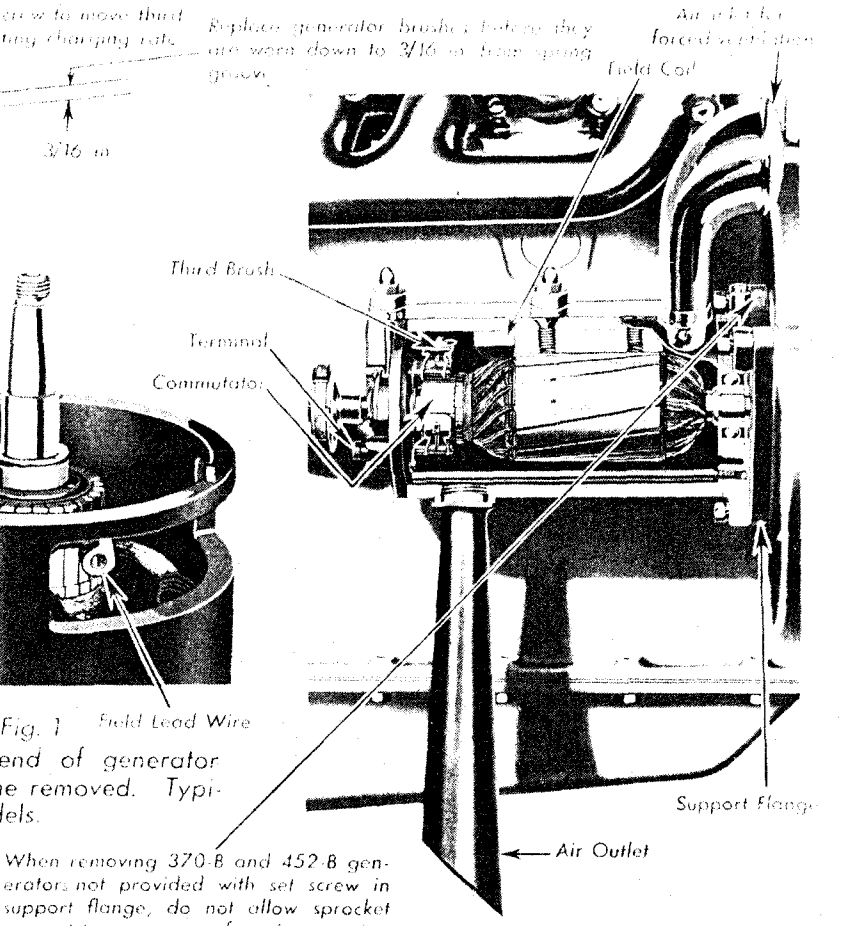


Fig. 2
Sectional View of Cadillac 452-B Generator
Typical of all models

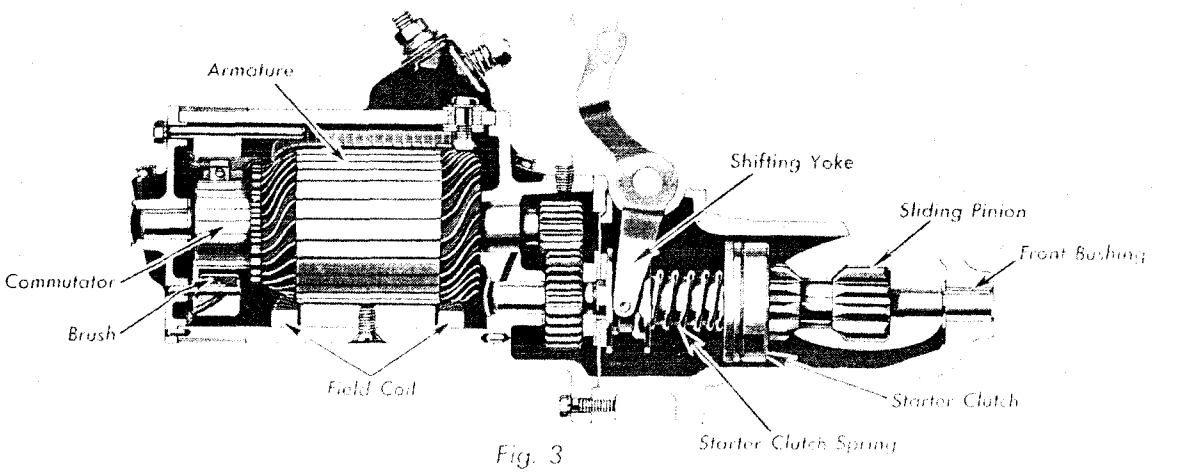


Fig. 3
Starting Motor
Typical of all models

Plate 19. Generator and Starting Motor Details

ELECTRICAL SYSTEM

General Description

Cadillac and LaSalle electrical systems are of the same general arrangement except the ignition and lighting circuits. The ignition systems are necessarily different because of the difference in the number of cylinders in the eight, twelve and sixteen cylinder engines. The lighting is practically the same on all models except the 345-B.

The Delco storage batteries used on the Cadillac and LaSalle are of large capacity with the cells arranged side by side. The 345-B and 355-B batteries have 17 plates, while the 370-B and 452-B batteries have 21 and 25 plates, respectively.

The battery on all models is carried in the right front fender. The cover over the battery forms a part of the fender and is held in place by four screws, one in each corner. A corresponding compartment and cover are provided on the left side of the car for tire chains.

The Delco-Remy generators used on Cadillac and LaSalle cars are of the ventilated type with third-brush thermostatic control. They are mounted on the right hand side of the engine and are chain driven. The cut-out relay is mounted in the circuit control box on the dash. See Fig. 1, Plate 20.

HORNS

Both the Cadillac and the LaSalle are equipped with two horns, one under each head lamp. The horns are matched and should be serviced in pairs.

The horns are operated through a magnetic relay which in turn is operated by the horn button. Instead of a heavy wire being used between the horn button and the horns heavy wires are used only between the horns and the relay which is in the circuit control box. A smaller wire is used between the horn button and the relay. This eliminates the passing of a heavy current through the horn button and minimizes the voltage drop in the wiring, giving a more nearly uniform voltage at the horns.

IGNITION

On Cadillac 8 and LaSalle cars the ignition system is of the same general arrangement. On the 370-B and 452-B cars, the ignition systems are also similar, each consisting of two separate circuits, one for each cylinder block, controlled by the same switch. Each circuit has its own coil, contact points, condenser and set of distributor terminals.

The ignition coil for the 8 cylinder cars is mounted on the driver's side of the dash. On the 370-B and 452-B cars, the coils are mounted in recesses in the upper tank of the radiator where they are protected from moisture and excessive heat.

The distributors are fully automatic, no manual advance being provided.

The 370-B and 452-B distributors have a special double-end rotor which distributes the high tension current to the right hand cylinders from one end, and to the left hand cylinders from the other end. The end which takes care of the right hand cylinders is connected to the terminal in the center of the distributor cap. The other end of the rotor, which provides for the left hand cylinders, is connected to the off-center coil terminal.

The contacts at the end of the 370-B distributor rotor are not exactly 180° apart because of the alternate 45° and 75° firing intervals of the engine. A 45° interval (on the crankshaft) comes after each of the right hand cylinders fires and a 75° interval comes after each of the left hand cylinders fires.

The cylinders in all engines are numbered from the front, according to location rather than firing order. The 345-B and 355-B engines have the even numbered cylinders on the left side and the odd numbered cylinders on the right side. On the 370-B and 452-B the numbering system is just the reverse to that of the 8 cylinder engines with the even numbered cylinders on right and the odd numbered on the left.

The contact arms operate alternately and are mounted at an angle of 30° for the Cadillac 8 and LaSalle, and at 22-½° for the 370-B and 452-B.

The breaker cam on the 345-B and 355-B is integral with the distributor shaft and the timing of the contact arm for the right hand cylinders is done by rotating the distributor on its support. A pointer and graduated dial indicates the amount the distributor is moved. The right hand contact arm in the 370-B and 452-B distributor is timed either by turning the cam or rotating the distributor. The left hand arm on all models is mounted on an adjustable plate and is timed by an eccentric adjustment which must be synchronized with that of the other arm. Adjustment of this plate does not disturb the contact point gap.

The breaker cam has four lobes on the Cadillac 8 and LaSalle distributors, six on the 370-B and eight on the 452-B.

The automatic spark control mechanism is the same on all models.

ELECTRICAL SYSTEM

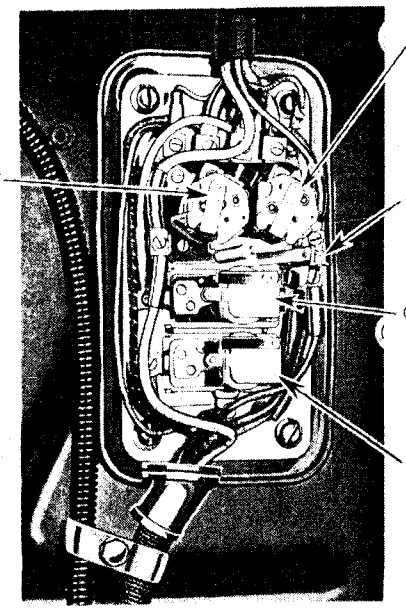
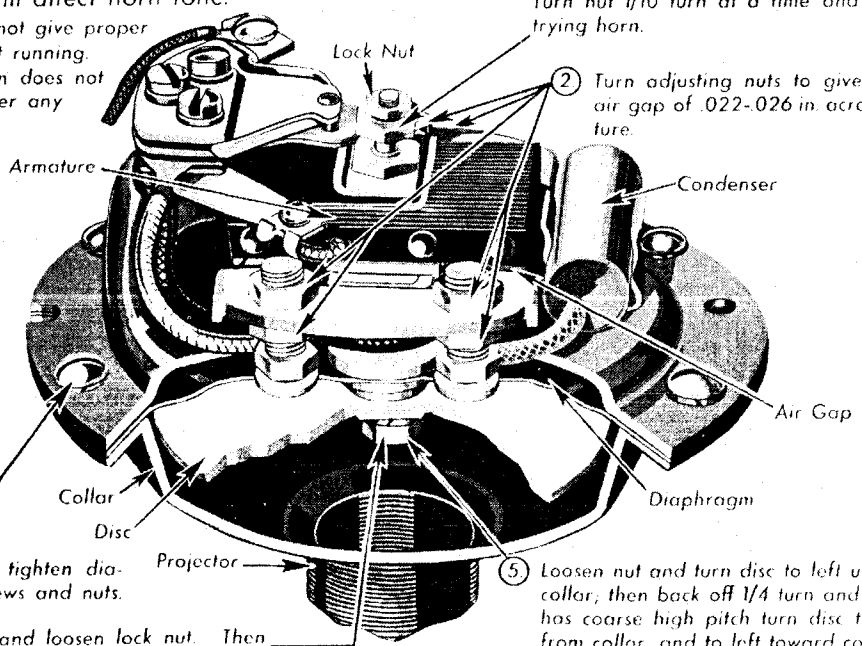


Fig. 1
Circuit Control Box
The circuit control box is located on the dash under the cowl.

Before attempting to adjust horn, check for following conditions which will affect horn tone:

Low Battery—Horn will not give proper tone with engine not running.

Poor Connections—Horn does not give good tone under any driving conditions.



(1) Remove cover and tighten diaphragm flange screws and nuts.

(2) Turn adjusting nuts to give uniform air gap of .022-.026 in. across armature.

(3) Remove projector and loosen lock nut. Then turn disc all the way to right and tighten lock nut.

(4) Turn adjusting nut to secure current consumption of 5.5-6.5 amps. tested with precision ammeter. Turn nut 1/10 turn at a time and lock before trying horn.

(5) Loosen nut and turn disc to left until it touches collar, then back off 1/4 turn and lock. If horn has coarse high pitch turn disc to right away from collar, and to left toward collar if pitch is too low. Projector must be in place to test horn.

Fig. 2
Horn Adjustments
Test each horn separately and tune up the one which is most out of adjustment. Then adjust the other horn to a tone that harmonizes with the first.

Plate 20. Circuit Control Box and Horn Adjustments

ELECTRICAL SYSTEM—General Description—Service Information

The starting motors used are of the same general construction, differing principally in the size and number of poles. Those used on the 8-cylinder cars are of the four pole type, while those on the 12- and 16-cylinder cars are of the six pole type Four brushes are standard on all starting motors.

The starting motor cranks the engine through internal reduction gears.

The driven gear on the engine is mounted on the flywheel on the 345-B, 355-B and 370-B and on the center clutch driving plate on the 452-B.

WIRING

The general arrangement of the chassis wiring is the same in all models. The wires are grouped in a braided varnished harness and wherever possible are carried in a corner of the side bar.

The stop and back-up lamps are connected in the ignition circuit and are protected by a fuse in the circuit control box.

A feature of the electrical system is the circuit control box. This box is located in the rear of the dash under the cowl and contains the circuit breaker, the generator cut-out relay, the horn relay and the fuse for the stop light and back-up light circuit. It also serves as a junction box for the wire connections.

Service Information

1. Connections for Electrical Accessories.

When installing additional electrical equipment, such as radios, heaters, spot lights, cigar lighters, etc., it is important to make sure that they are properly connected so that they will not interfere with the normal operation of the circuit breakers and at the same time protect the circuit in case of a short or ground.

When spot lights or other special lighting equipment, except cigar lighters and radios, are installed, it is best to connect them to the No. 1 terminal on the circuit breaker, which takes the current through the lock-out breaker. If, however, too many such accessories are installed, the breaker will open due to the excessive load.

In such cases it is advisable to connect some of the equipment to the No. 3 terminal on the circuit breaker, which is the feed from the ammeter. Any circuits connected to the No. 3 terminal are accordingly unprotected circuits; that is, the current for these circuits will not go through the breakers at all. Cigar lighters and "A" battery connections for radios unless otherwise recommended in the instructions accompanying the unit should be connected directly to the discharge terminal of the ammeter.

2. Battery Terminal Corrosion

See that the battery terminals are clean and free from corrosion. Warm water, poured slowly over the corroded battery terminals will dissolve the copper sulphate that has been deposited so that it can be brushed off and flushed away easily. The terminals and battery posts should be wiped with a cloth saturated with household ammonia or a solution of water and bicarbonate of soda (baking soda). These alkaline solutions will neutralize any acid that may be present on the parts to be cleaned. **Do not allow any of the alkaline solution to get into the cells of the battery.** After the parts are cleaned they should be given a heavy coat of vaseline or grease to retard further corrosion.

3. Battery Electrolyte Tests

The Electrolyte (battery solution) should be tested with a hydrometer. The specific gravity as registered by the hydrometer should be 1.270 to 1.290 at 60° F. when the battery is fully charged. A gravity reading of 1.150 or below indicates that the battery is entirely discharged and it should be removed from the car and recharged.

Whenever a reading under 1.250 is due to a temporary abnormal demand for current through excessive use of lights or starter, the charging rate should be sufficient to bring the battery up to a fully charged condition again. On the other hand, if the current requirements have been normal and it appears that the charging rate is not high enough to meet the requirements of the electrical system, the generator should be adjusted for a slightly higher charging rate but not to exceed the maximum rate recommended for that generator. If the electrolyte tests below 1.225, the battery should be recharged from an outside source.

4. Adding water to Storage Battery.

The correct level for the battery electrolyte is just below the bottom of the filler tubes. If the liquid comes above the bottom of the tubes it may be forced up and overflow because of pressure generated within the battery by its "gassing."

Inspect the battery every 1000 miles during the winter and every 500 miles (or every two weeks) during the summer, to make sure the electrolyte is up to the proper level. Only distilled water or fresh water kept in a glass, rubber or porcelain lined container, should be used to replace liquid lost through evaporation.

If electrolyte has been lost through overflow or spilling, it should be replaced by a competent battery repair man.

5. Ball Bearing Service

When the ball bearings are removed from the generator or distributor, they should be thoroughly cleaned by spinning them in gasoline or kerosene and blowing out with compressed air until all foreign matter and grease are removed. The bearings should then be oiled immediately with clean engine oil and inspected.

Inspect each bearing by rotating it by hand with pressure on the outer race. If the bearing feels smooth under pressure and rotates easily it should be reinstalled in the car. If the bearing feels rough and does not rotate easily, it should be replaced with a new one.

Before installing the ball bearing in the car, it should be packed solid with a high melting point sodium base grease (Fiske No. 220-A, or its equivalent), which lubrication should be good for approximately 15,000 miles.

6. Running Engine with Storage Battery Disconnected

If it should ever be necessary to operate the engine without the battery connected in the circuit, the generator must be grounded first or it will be damaged. One end of the grounding wire should be connected to the front binding post on the cut-out and the other connected to the ground under one of the cut-out mounting screws.

7. Dictograph Phone Replacement

The phone units in Fleetwood Imperial and Town cars are installed in matched pairs. If it is ever necessary to replace either unit, they should both be removed and a new matched pair installed in their places.

In the event of weak signals with pairs known to be properly matched, check carefully for loose connections and possible shorts or grounds in the wiring caused by staples or tacks.

ELECTRICAL SYSTEM

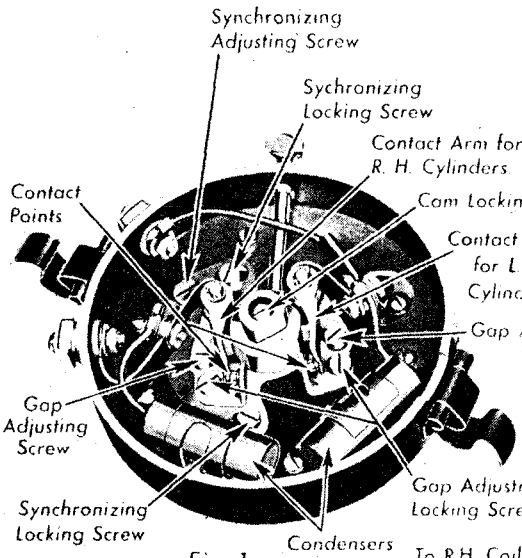


Fig. 1
Top view of Cadillac 370-B timer-distributor with cap and rotor removed. Typical of 452-B.

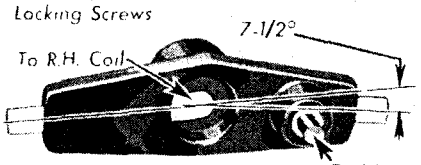


Fig. 3
Distributor Rotor—Cadillac 370-B

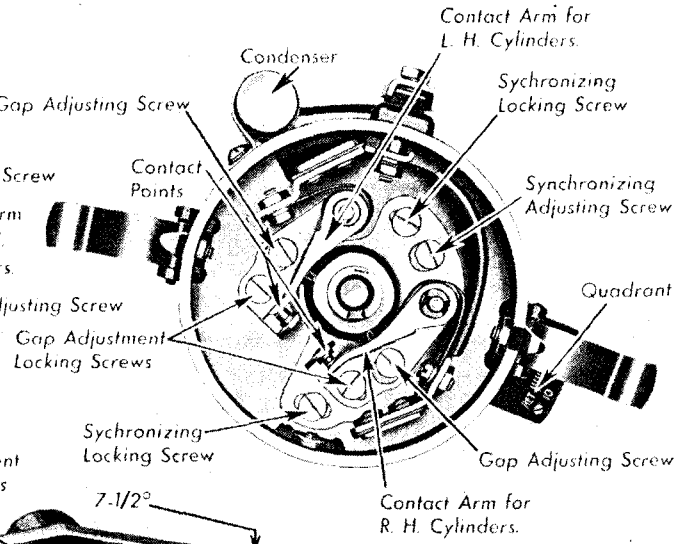


Fig. 4
Top view of timer-distributor with head and rotor removed—Cadillac 355-B - La Salle 345-B.

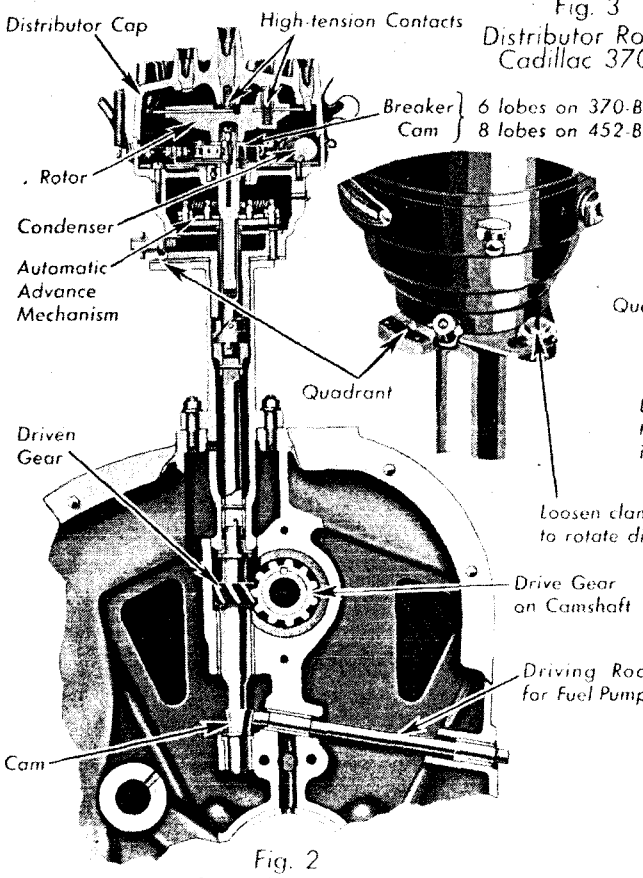


Fig. 2
Sectional View of Cadillac 370-B Timer-distributor and Drive. Typical of 452-B.

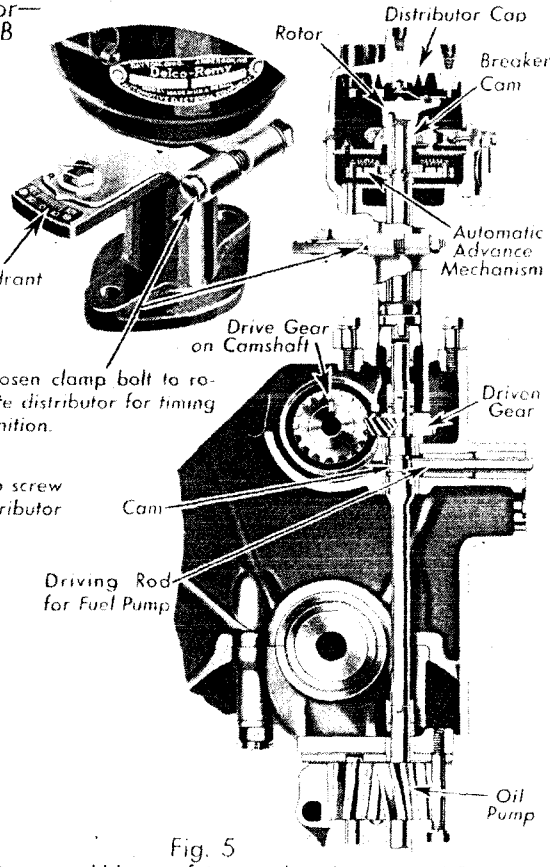


Fig. 5
Sectional View of Timer-distributor and Drive—Cadillac 355-B - LaSalle 345-B.

Plate 21. Ignition Distributor

ELECTRICAL SYSTEM—Specification

Subject and Remarks	LaSalle	Cadillac		
	345-B	355-B	370-B	452-B
Accessories, connections of electrical (See Note 1)	.....	.....	.....	.....
Battery				
Delco type number	17 BW	17 BW	21 CW	25 AW
Capacity—				
20 hour rate	130	130	160	190
20 min. rate	156	156	195	234
Charging rate on bench—				
Start in amperes	10	10	10	10
Finish in amperes	8	8	8	8
Corrosion at terminals (See Note 2)	.....	.....	.....	.....
Plates, number of	17	17	21	25
Specific gravity of battery electrolyte solution (See Note 3)	.....	.....	.....	.....
Terminal grounded	Positive	Positive	Positive	Positive
Voltage—rated	6	6	6	6
Water, addition of (See Note 4)	.....	.....	.....	.....
Circuit Control Box				
Delco-Remy type number	480Z	480Z	480Z	480Z
This box contains the circuit breakers, the generator cut-out relay and the horn relay.				
Circuit breaker—				
Lockout opens—No. of amperes	25-30	25-30	25-30	25-30
Vibrator starts—No. of amperes	25-30	25-30	25-30	25-30
Fuse for stop lamps—				
Capacity	10 amps.	10 amps.	10 amps.	10 amps.
Cut-out relay—				
Air gap between armature and core	.014-.021"	.014-.021"	.014-.021"	.014-.021"
Hold contacts together lightly while measuring air gap.				
Contact gap	.015-.025"	.015-.025"	.015-.025"	.015-.025"
Operation				
Contacts close—No. of volts approximately	7.5	7.5	7.5	7.5
Corresponding armature speed 420 R. P. M.; car speed 8-10 M. P. H.				
Contacts open—At discharge, in amperes	0-2.5	0-2.5	0-2.5	0.-2.5
Generator				
Delco-Remy type number	927-S	927-S	931-D	931-D
Car speed for maximum normal charging (approximately)	22 m.p.h.	22 m.p.h.	23 m.p.h.	23 m.p.h.
Armature				
Commutator out of round, not over	.002"	.002"	.002"	.002"
End-play in ball bearing (Side movement between races), not over (See Note 5)	.012"	.012"	.012"	.012"
Brushes				
Limit of wear (See Fig. 1, Plate 19)	.....	.....	.....	.....
Spring tension in ounces	20-28	20-28	20-28	20-28
Charging rate on bench—in amperes				
700 R. P. M. at 7.2-7.4 volts—Cold	7	7	7	7
1400 R. P. M. at 8.2-8.6 volts—Cold	19-21	19-21	19-21	19-21
1600 R. P. M. at 7.3-7.7 volts—Hot	10-15	10-15	10-15	10-15
Charging rate on car—In amperes (Maximum—Cold)	22-24	22-24	22-24	22-24
Measured with testing Ammeter at Generator terminal				
Current regulation	.....	.....	.....	.....
All models—Third brush thermostat control				
Ratio of generator R. P. M. to engine R. P. M.	1.35 to 1	1.35 to 1	1.40 to 1	1.40 to 1
Running engine with storage battery disconnected (See Note 6)	.....	.....	.....	.....
Starts to charge (cut-out contacts close)—Armature speed in R. P. M. at 7.5 volts	525	525	550	550
Stops charging (cut-out contacts open)—Amperes discharge	0-2	0-2	0-2	0-2
Thermostat operating temperature	175° F.	175° F.	175° F.	175° F.
Resistance in series with field coil.				
Voltage—rated	6	6	6	6

ELECTRICAL SYSTEM

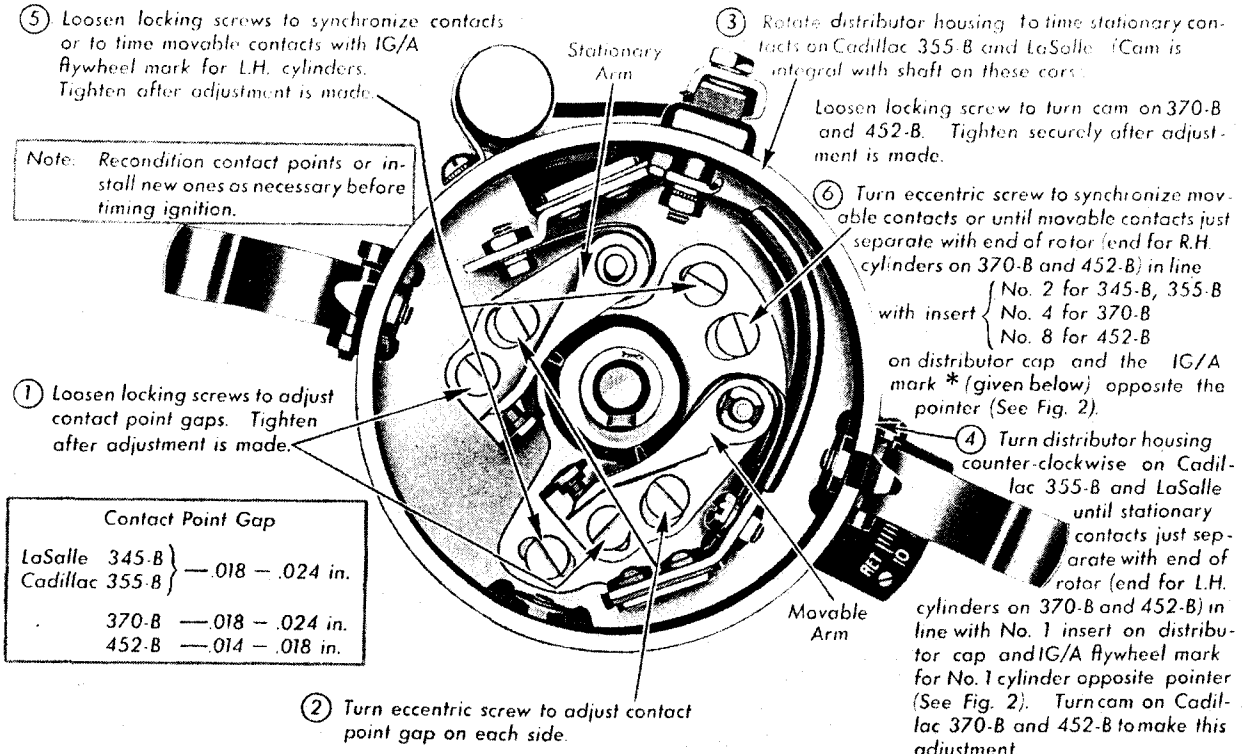


Fig. 1
Typical Timer Distributor Adjustments

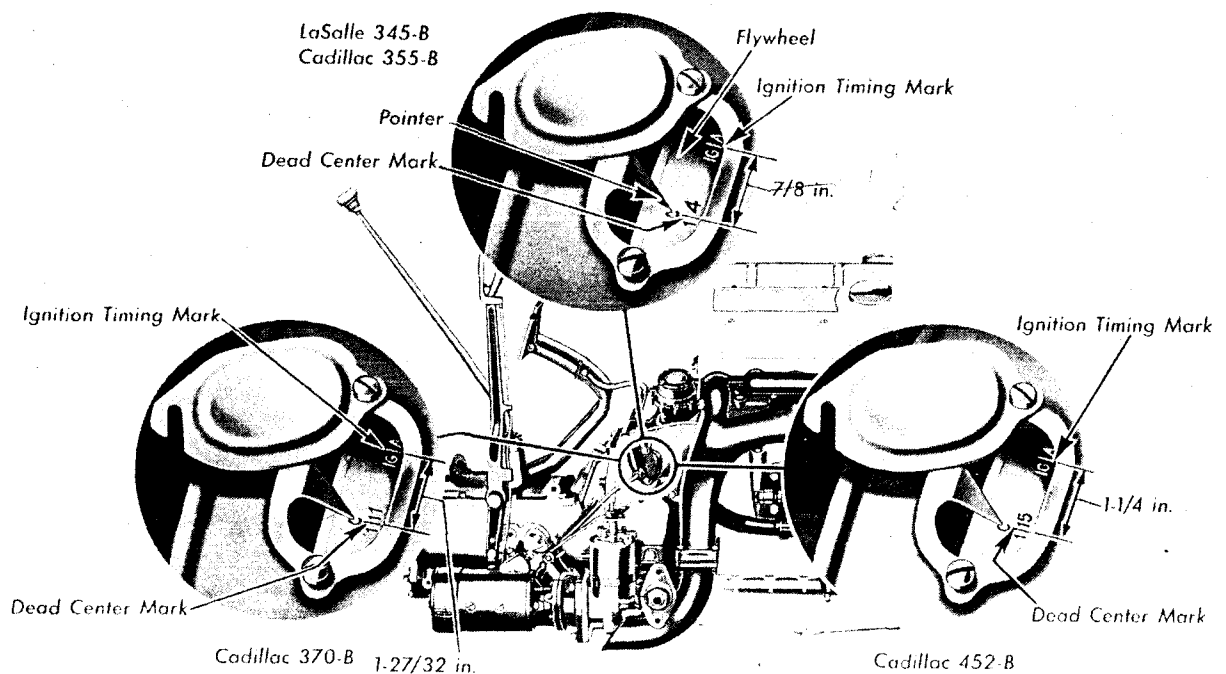


Fig. 2
Ignition Timing

Plate 22. Ignition Timing

ELECTRICAL SYSTEM—Specifications

Subject and Remarks	LaSalle	Cadillac		
	345-B	355-B	370-B	452-B
Horn				
Delco-Remy (Klaxon) type number	K-26 { 1379 / 1380	K-22 { 1160 / 1161	K-22 { 1160 / 1161	K-22 { 1160 / 1161
Adjustment—				
Air gap between armature and field core	.025″	.025″	.025″	.025″
Current consumption in amperes	7-8	7-8	7-8	7-8
Number used	2	2	2	2
Ignition				
COIL				
Delco-Remy type number	528-G	528-G	530-K	530-K
Current consumption in amperes				
Engine running	2.5	2.5	2.5	2.5
Engine stopped	2	2	2	2
DISTRIBUTOR				
Delco-Remy type number	662-Y	662-Y	004092	004093
Angle between contact arms	30°	30°	22½°	22½°
Contact point gap	.018-.024″	.018-.024″	.018-.024″	.014-.018″
Firing order	NOTE: Cylinders are numbered from the front, alternating between the two sides. On 345-B and 355-B, No. 1 is *right* front; on 370-B and 452B, No. 1 is *left* front.			
345-B, 355-B—1-2-7-8-4-5-6-3				
370-B—1-4-9-8-5-2-11-10-3-6-7-12				
452-B—1-8-9-14-3-6-11-2-15-10-7-4-13-12-5-16.				
Radial (side) play in distributor shaft ball bearing, not over (See Note 5)	.....	.....	.002″	.002″
Spark advance (degrees on flywheel)—				
Automatic (Maximum)	18°	18°	32°	32.5°
Tension of contact arm spring—In ounces	17-21	17-21	17-21	17-21
Timing mark (IG/A) ahead of center	{ 9° 12′ / 1⅛″	{ 9° 12′ / 1⅛″	{ 15° / 1 13/16″	{ 10¼° / 1¼″
SPARK PLUGS				
A. C. type number	D-8	D-8	D-8	D-8
Cooler plug to remedy pre-ignition	D-7 or D-6	D-7 or D-6	D-7 or D-6	D-7 or D-6
Hotter plug to remedy fouling	D-9 or D-10	D-9 or D-10	D-9 or D-10	D-9 or D-10
Coated with Duco	.....	.....	.....	.....
Any Duco on the spark plugs should be removed with thinner or alcohol.				
Gap	.025-.028″	.025-.028″	.025-.028″	.025-.028″
Thread	Metric, 18 mm.	Metric, 18 mm.	Metric, 18 mm	Metric, 18 mm.
IGNITION SWITCH				
Delco-Remy type number	426-T	426-T	426-T	426-T
Starting Motor				
Delco-Remy-type number	728-P	728-P	000495	000495
Armature				
Clearance between shaft and bearings (bushings), not over	.010″	.010″	.010″	.010″
Commutator out of round, not over	.002″	.002″	.002″	.002″
End play, not over	.025″	.025″	.025″	.025″
Brushes				
Number used	4	4	4	4
Clutch spring on splined shaft				
Free length (approximately)	2¼″	2¼″	2¼″	2¼″
Compression in pounds at 1 in.	46-52	46-52	46-52	46-52
Engine cranking speed	90-100 R.P.M.	90-100 R.P.M.	80 R.P.M.	80 R.P.M.
Gear Ratios				
Ratio between armature pinion and sliding gear	2-1/14:1	2-1/14:1	1-2/3:1	1-2/3:1
Ratio between sliding gear and flywheel	12-5/9:1	12-5/9:1	12-5/9:1	12-5/9:1
Ratio between armature pinion and flywheel	26:1	26:1	26:1	26:1
Gears				
Number of teeth in armature pinion	14	14	15	15
Number of teeth in driven gear on sliding gear shaft	29	29	25	25
Number of teeth in sliding gear	9	9	9	9
Number of teeth in flywheel gear	113	113	113	113
Number of poles	4	4	6	6
Telephone				
(See Note 7)	.....	.....	.....	.....

ELECTRICAL SYSTEM

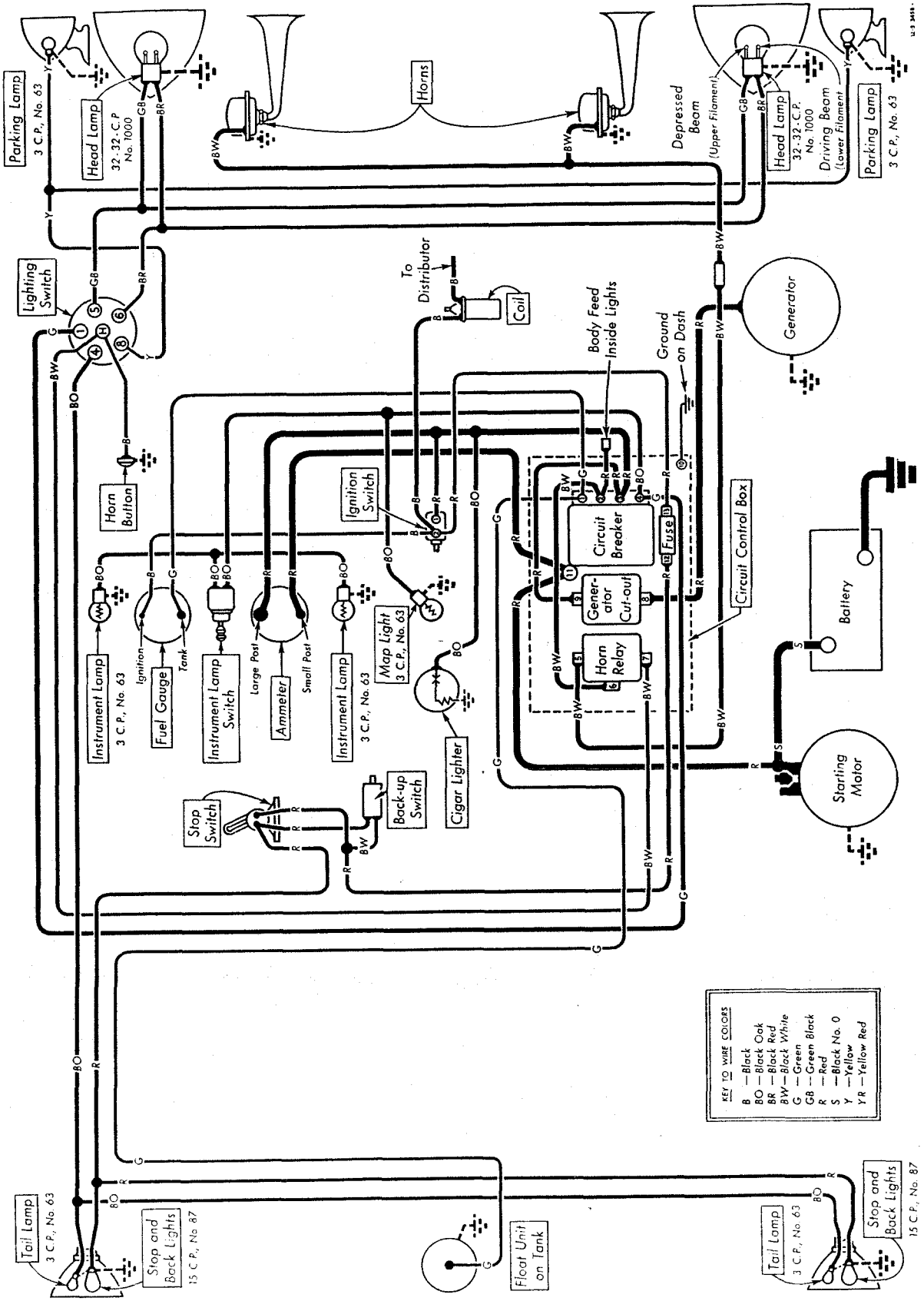


Plate 23. LaSalle 345-B Wiring Diagram

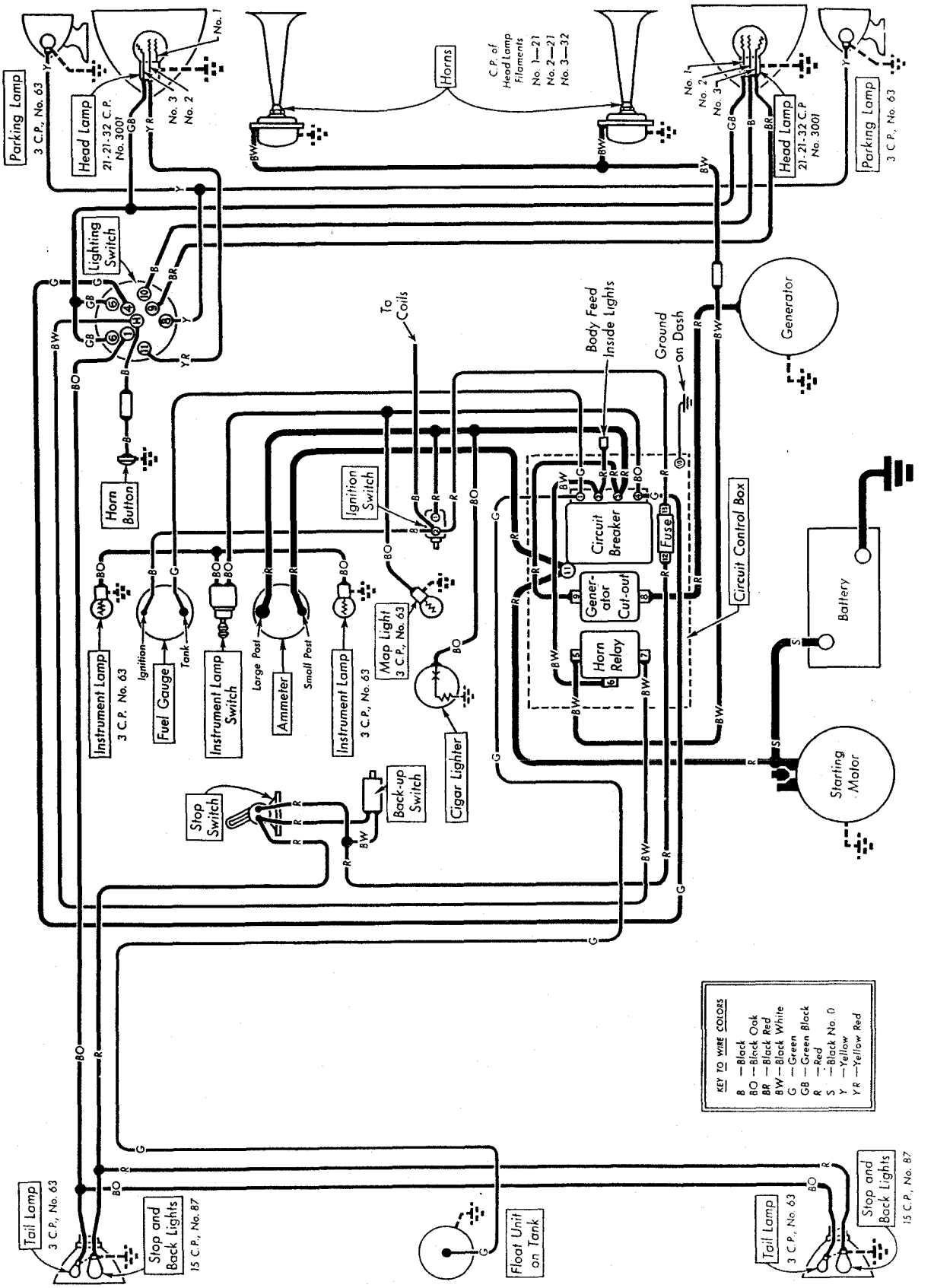


Plate 24. Cadillac 355-B, 370-B and 452-B Wiring Diagram

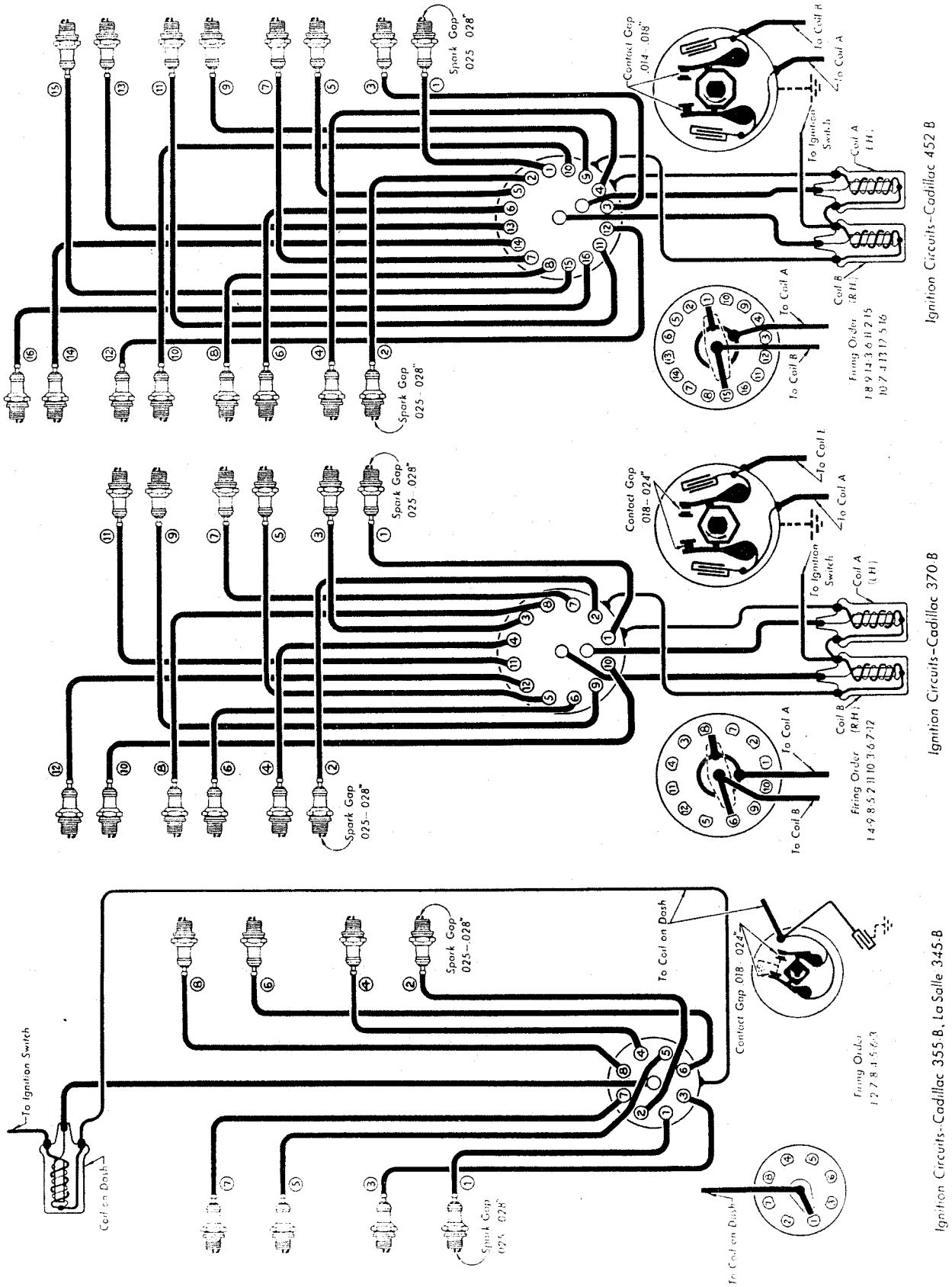


Plate 25. Ignition Wiring Diagram

ELECTRICAL SYSTEM—General Description—Service Information

General Description

The electrical system on the "C" series cars is practically the same as on the corresponding "B" models. The only differences are in the distributor and the spark plugs.

Beginning with engine unit 30-3607, the 345-C and 355-C engines are equipped with a second-type distributor with a single set of contact points and an eight lobe cam. This distributor can be identified by the type No. 661-P.

The distributor unit used on the V-8 engines before engine unit 30-3607 is the same as provided for the "B" series cars.

The advance mechanism in the 370-C and 452-C distributors incorporates new advance characteristics to compensate for the higher engine compression ratios used in these cars. Otherwise these distributors are the same as used on the "B" models. The "C" distributors can be identified by the type numbers 004110 for the 370-C and 004111 for the 452-C.

The spark plugs used on all "C" series cars are of the "G-7" type. These plugs are especially designed with a pointed porcelain at the electrcde end for heavy duty work in extremely high compression engines.

Service Information

8. Ignition Timing

The method of timing the "C" series engine is the same as on the corresponding "B" cars. The contact gap for both the distributor and the spark plugs on all "C" cars except the V-8 beginning engine unit 30-3607 is also adjusted the same as on the "B" models. The distributor contact gaps for the V-8 engines using the 661-P distributor is .012 to .017 in. With the single arm type 661-P distributor there is nothing to be synchronized or checked relative to the second firing point. All remaining adjustments, however, are the same as with the stationary contacts in the earlier distributors of the double-arm type. See Plate 25A.

9. Winter Care of Storage Battery

The condition of the storage battery is one of the most important factors in easy starting. Even with winter lubricants, the engine is stiffer in cold weather and more power is required to turn it over. At the same time, the drain on the battery is increased in winter because, in addition to the greater power required in starting, the days are shorter requiring greater use of lights, and heaters with electric blowers are frequently used. All of this simply means that the battery must be in top condition from the start and must be kept in that condition throughout the cold weather season.

Battery trouble in any weather can be avoided with a little care and attention. The battery is a perishable item, and gradually deteriorates during any period of inactivity. This deterioration is shown in a gradual dropping of the specific gravity of the solution in the cells.

Ordinarily a battery not in use requires a freshening charge every 30 to 60 days to prevent rapid deterioration. A regular schedule for charging works out most satisfactorily, but in any case, a close check should be kept on the condition of the battery through records of the specific gravity of each cell taken every two weeks. The battery should be charged whenever the specific gravity drops below 1.225.

Batteries in cars on display or in storage can be charged without removing the battery from the car by using any good portable charger. The charger should be connected to the storage battery or the negative terminal on the charger can be connected to the ammeter on "B" and "C" series cars with the generator cut-out relay in the circuit control box. If the car is to remain in storage for any considerable time, however, it is advisable to remove the battery and turn it over to the battery department for care and attention.

The battery must be kept fully charged or nearly so and the proper level of the liquid must be maintained if the battery is to perform satisfactorily. Ordinarily with the car in use the generator will keep the battery charged but there is only one way to make sure and that is to test the battery at regular intervals.

If the specific gravity is 1.250 or above, the battery may be safely assumed to be in satisfactory condition.

If the reading is below 1.225 the battery should in every case be removed and charged.

10. Cautions on Adjusting Charging Rate

Setting the generator charging rate is not a cure-all for electrical troubles of a car indicated by a low battery, and careless setting to the maximum charging rate may result in generator troubles much more serious than recharging the battery occasionally from an outside source.

Ordinarily the maximum charging rate should be more than enough to keep the battery fully charged, but whenever it is necessary to set the generator at its maximum, special precautions must be taken to keep the armature from burning out.

The car ammeter must not be relied upon when setting the generator anywhere near its maximum limit. There are two discrepancies in the car ammeter for which allowances must be made if it is to be used at all in setting the charging rate.

1. The ammeter does not show the actual generator output, but shows the difference between the output and the ignition current which is about 2½ amperes per coil.

2. The car ammeter is not a precision instrument and the possible error may amount to as much as 2 amperes.

With allowances made for the ignition and the possible error therefore, the difference between the actual generator output and the reading of the ammeter may amount to 4½ amperes on V-8 cars and 6 to 7 amperes on V-12 and V-16 cars.

From this it can readily be seen that the only safe way to set the charging rate near the maximum is to use a precision ammeter connected at the generator. On "B" and "C" series cars the charging rate should not exceed 22-24 amperes cold, measured at the generator.

Equally essential to the accuracy of this adjustment is a fully charged battery. If the battery in the car is partly run down, the generator charging rate will increase as the battery becomes more fully charged, resulting in the output exceeding the safe limit.

It is extremely important in setting the generator to the maximum charging rate that a fully charged battery be used in the car and that the output be measured with a precision ammeter connected at the generator.

It is also a good plan to inspect the battery terminals to make sure that they are clean and tight. Loose or corroded terminals will increase the voltage to such an extent that the entire electrical system will be overheated and the generator, lamp filaments and contact points may be burned out.

A similar condition may be found in any case where, through overheating, the solder holding the armature wires to the commutator has been melted and thrown out. In such cases, the armature wires may be loosened by centrifugal force at high speeds, making poor contact and permitting the charging rate to drop excessively even though at ordinary speeds the charging rate is sufficient. This condition in the armature may not always show up as an open circuit in a bench test, but if the commutator shows signs of having thrown the solder, the commutator should be resoldered.

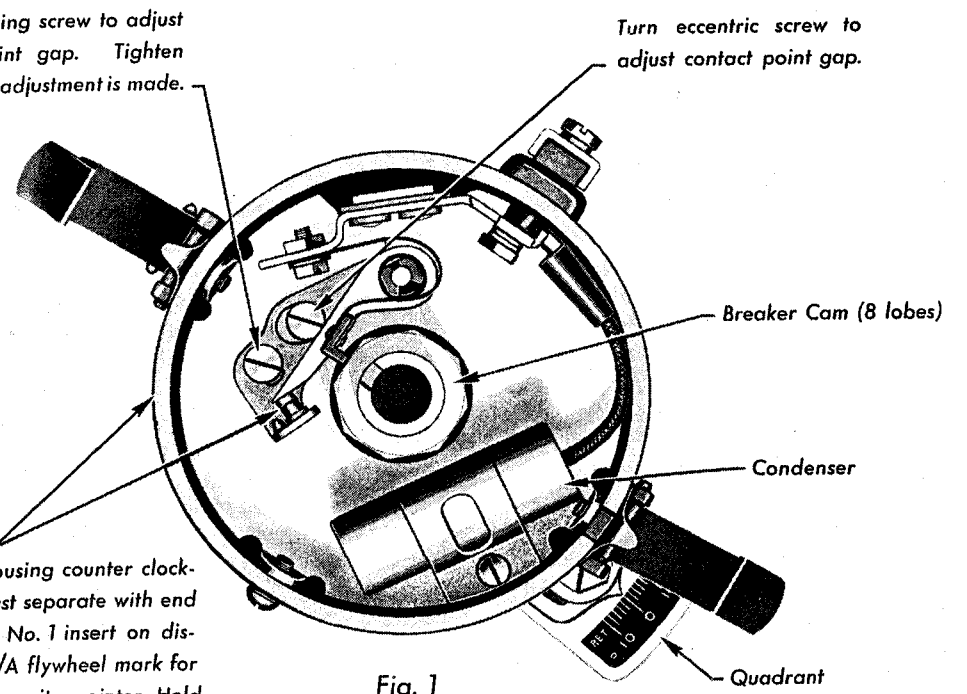


Fig. 1

Timer-distributor Adjustments

Note: Recondition contact points or install new ones as necessary before timing ignition.

Contact Point Gap (Second-type distributor)	
LaSalle 345-C, Cadillac 355-C	.012-.017 in.

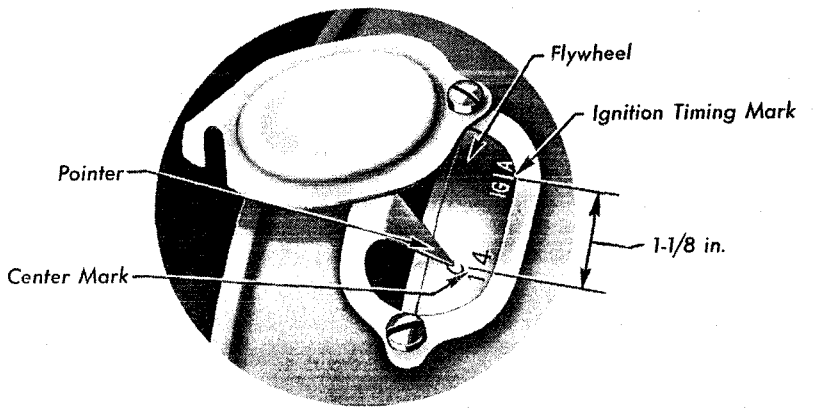


Fig. 2

Flywheel Timing Mark

Plate 25A. Ignition Timing—Cadillac 355-C and LaSalle 345-C Using Type 661-P Distributor

ENGINE

General Description

The LaSalle and Cadillac V-8 engines are identical in construction. The intake manifold is arranged to supply all cylinders with exactly the same amount of fuel mixture. Each of the four end cylinders receive fuel through separate individual passages. The intake manifold is heated by the exhaust gas in the exhaust header.

These engines, as well as the 12-and 16-cylinder engines, are mounted in rubber at six points—one at each side at the front, one at each side at the rear of the crankcase and two at the rear of the transmission. The support brackets at the front end of the engine are at the sides of the front cover and rest on supports integral with the front frame cross member. The supports at the rear of the crankcase are attached to the frame side bars and those at the rear of the transmission to the center cross member of the frame.

The 370-B and 452-B engines are of the same general design. The 452-B engine has four more cylinders and a ⅛ in. smaller bore than the 370-B.

A harmonic balancer is used on the front end of the 370-B and 452-B crankshaft in addition to counter weights forged integral with the crankshaft cheeks.

The angle between the cylinders on these engines is only 45°. This gives ample room on the outside of the cylinder blocks for manifolds and carburetors.

The 370-B and 452-B engines have overhead valves which are provided with an automatic adjusting mechanism. This mechanism automatically maintains practically zero valve clearance and effectively overcome the objectionable noise usually characteristic of this type of valve.

The general arrangement of this valve mechanism is shown in Plate 31, Page 62.

The engine lubrication is full force feed to all bearings including the valve rocker arms. The oil filter is connected in the line leading to the valve mechanism to eliminate any possibility of foreign matter getting into the dashpots of the valve mechanism and interfering with their operation.

The compression ratio of the 370-B and 452-B may be changed by merely using a cylinder head gasket of different thicknesses. To change to lower compression a special cylinder head gasket with a sheet steel insert of a definite thickness between the layers of asbestos should be used. This makes it possible to change to a lower compression at a very slight cost wherever the fuel situation demands it.

This method of changing the compression ratio is not practical on L-head engines, because of the construction of the combustion chamber, and by the fact that it involves less expense to change cylinder heads on an L-head engine.

The 12- and 16-cylinder engines are the only Cadillac engines on which the factory sanctions carbon burning. When this operation is performed properly, the results are quite satisfactory in these engines. On V-8 engines, however, where it is a simple operation to remove the cylinder heads without interfering with the valve mechanism, the carbon can be removed to better advantage by scraping.

The windshield wiper vacuum pump used on all models is of the diaphragm type and acts only as a booster to augment the manifold suction for operating the windshield wiper at higher engine speeds. It is located in the same position as the vacuum pump formerly used to supply fuel.

Service Information

1. Camshaft Installation

Beginning with engine unit 11-1148 on 345-B and 12-1126 on 355-B cars, a second type camshaft is used. This camshaft calls for a different setting of the valve stem clearance.

On cars before these engine unit numbers with the first type camshaft, the valve tappets should be adjusted to .004 in. for inlet valves and .006 in. for exhaust valves.

On cars with the second-type camshaft the clearance should be .006 in. for inlet valves and .008 in. for exhaust valves.

The second-type camshaft can be identified by a "Z" in a circle stamped on the hub of the front bearing. When the camshaft is in the car, this mark can be seen through the opening in the crankcase after removing the distributor mounting support.

2. Removing Camshaft from 370-B and 452-B Engine

When removing the camshaft from these engines, two important points in procedure must not be overlooked. The vacuum pump and the distributor drive shaft must be removed before any attempt is made to draw out the camshaft.

The gear on the distributor drive meshes with a gear on the camshaft. An attempt to remove the camshaft without first removing the distributor drive shaft will damage the driven gear by striking against the blank sides of the camshaft gear.

3. Connecting Rod Alignment

The alignment of Cadillac and LaSalle connecting rods by straightening is not recommended as the rod is liable to return to its former shape because of the toughness of the alloy steel used in its construction.

In an emergency, if straightening must be resorted to, the rod is more liable to hold its shape if it is bent a little farther than necessary and then bent back again until it is straight to offset the tendency of the metal to assume its original shape.

ENGINE

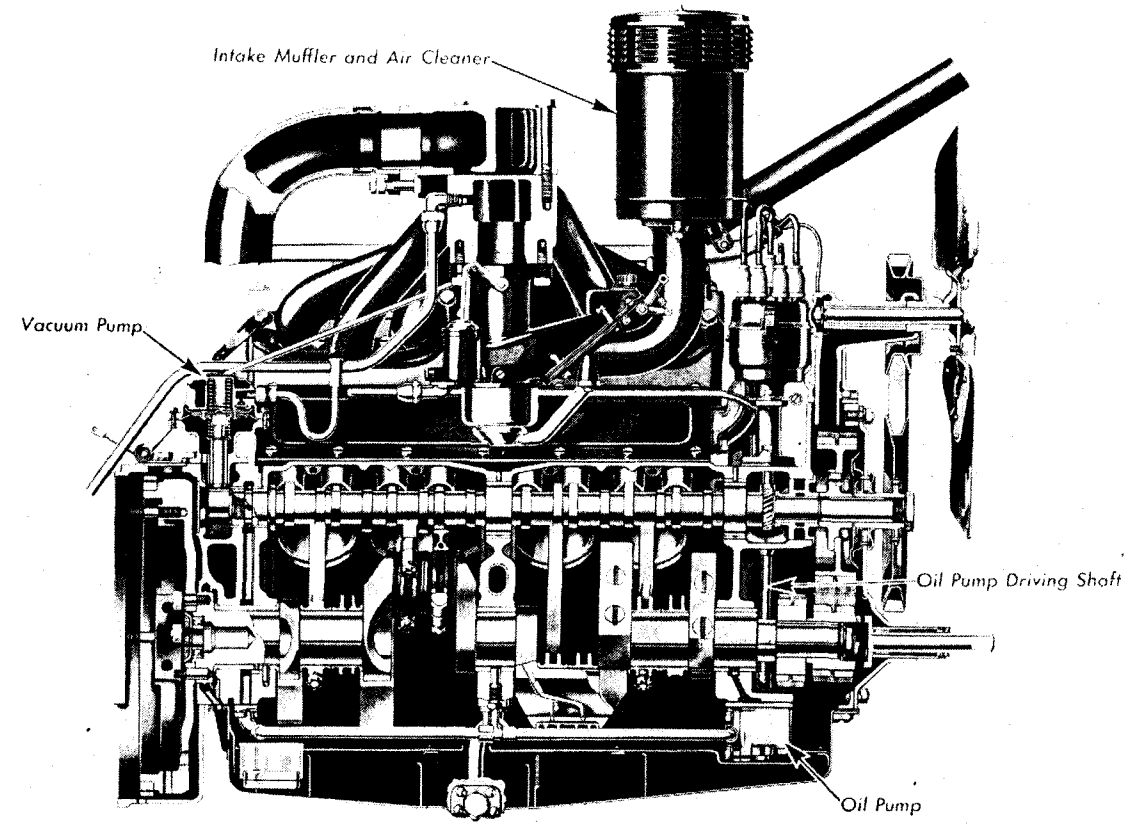


Fig. 1
Sectional View of Engine

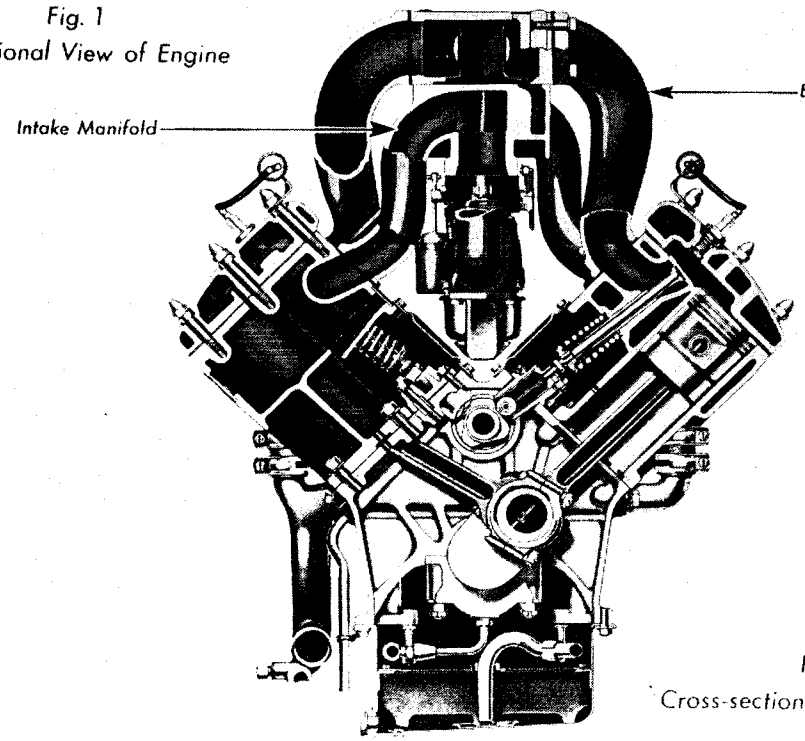


Fig. 2
Cross-sectional View of Engine

Plate 26. Sectional Views of Cadillac 355-B Engine. Typical of LaSalle 345-B

4. Assembly of Connecting Rods

When assembling connecting rods to the crankshaft, be sure that the numbers on the rods are towards the bottom of the engine and that they correspond with the numbers of the caps. The chamfered side of the bearing should be next to the crankshaft cheek.

The pistons should also be assembled on the rods with the piston pin locking screw on the same side of the rod as the flange.

5. Fitting Piston Pins

When pressing pins into or out of piston, always place locking screw side of piston down to prevent forcing piston out of round.

Burnish piston pin bushings using tool No. HMJ-250-2. Fit pins dry. Pins should turn freely in bushings with no perceptible play or looseness.

In production, piston pins are a tight press fit in the lock screw side of the piston. It is not expected that this press fit will always be duplicated in service and snug push fit should be satisfactory.

6. Connecting Rod Clearance

Check clearance in connecting rod bearing with dial indicator (Tool No. HM-196-B) and holder.

Do not attempt to adjust connecting rod bearings. If clearance exceeds limits given install new or rebabbited rod and return old one to factory for exchange. No credit will be allowed on rods if cap or rod has been dressed down.

The same conditions govern the return of rods which have been rebabbited by outside repair shops and which are damaged or bear punch or file marks used for identification purposes. Mechanics should attach numbered metal tags to the rods as they are removed from the engine, or lay them in trays in the right order to identify them instead of marking them with a punch or file.

7. Removing and Installing Piston Pin Bushings

The removal and installation of the split-type piston pin bushings requires the use of special tools. A kit of tools (Tool No. HMJ-250) is furnished for this purpose.

The bushing should be removed in an arbor press and should be started by giving the handle of the press a sudden jerk instead of a steady pull. After the bushing is started it will move out quite freely. The connecting rod should then be thoroughly cleaned of all chips and dirt.

The bushing cannot be pressed into the connecting rod in the usual manner. Instead, it is pressed in the rod and expanded with an expanding bar to press the bronze into very close contact with the steel rod. It is then burnished, leaving a long hard-wearing bearing surface.

To install a piston pin bushing, proceed as follows:

(1) Install the bushing in the side of the connecting rod having the large chamfer in the bearing for the crank pin. Make sure that the oil hole in the bushing is in line with the oil hole in the connecting rod and the split is at right angles to the length of the rod.

(2) Press bushing in rod using bushing replacer, tool No. HMJ-250-3. Use a 2 or 3 ton bench arbor press.

(3) Expand the bushing with Expanding Bar (tool No. HMJ-250-1). If the bushing protrudes through the connecting rod, file it flush with the rod before burnishing.

(4) Burnish bushing by passing burnishing tool No. HMJ-250-2 through the bushing. When expanding or burnishing a bushing, use a heavier bench arbor press of about 4 tons capacity.

Use kerosene as a lubricant when expanding and burnishing the bushing.

If the bushing moves during the burnishing process, it is too loose and another one should be used.

If the proper clearance between the piston pin and the bushing is not secured after the burnishing tool is passed through the bushing, the burnishing operation should be repeated to increase the size of the piston pin hole.

The press plate (Tool No. HMJ-250-4) should be used for expanding and burnishing the bushing. This plate has two holes—one which is used for assembling, expanding and burnishing and the other for removing the bushing.

After installing the bushing the parts should be thoroughly cleaned and the oil passages blown out with air to remove chips and dirt.

8. Main Bearing Clearance

Use dial indicator and special fixture (Tool No. HM 65530) for checking bearing clearances. If bearings are found to be worn beyond specified limits they should be replaced. Replacement bearings are furnished to exact size and do not require reaming or scraping. No shims or liners are used on the main bearings and no attempt should be made to take them up if worn.

Always install new wooden plugs in grooves in sides of rear main bearing cap to prevent oil leaks around the cap.

9. Cleaning Oil Filter on 370-B and 452-B

A Cuno disc-type self-cleaning oil filter is used on the 370-B and 452-B cars.

The oil, in circulating through the filter, passes between thin rotating discs, stacked one upon another, and separated a few thousandths of an inch by a series of thin stationary plates. The filtering discs are mounted on a shaft which extends above the filter and is connected to the starter pedal in such a way that the discs are rotated a partial turn each time the starter pedal is depressed.

When the filtering discs are rotated the accumulated sediment is scraped off by the stationary plates and falls to the bottom of the tank.

The only attention required is the draining of the tank every 6000 miles.

10. Piston Clearances

Use Tool HM 119929, with a .0025 in. feeler ribbon, ½ in. wide and a spring scale, for checking piston clearances. Piston must not be over .002 in. out of round. Clearances should be measured between skirt of piston and cylinder wall half way between wrist pin holes with piston half way down on its stroke and wrist pin hole parallel with crankshaft. Both piston and cylinder walls should be clean and free from oil. If the clearance is correct, a pull of 4 to 9 lbs on 345-B and 355-B engines and 6 to 9 lbs on 370-B and 452-B engines will be necessary to withdraw the feeler.

11. Burning Carbon on 370-B and 452-B Cars

While the most satisfactory way of removing carbon from automobile engines is by scraping, the labor involved in removing the cylinder heads with the overhead valve mechanism on the V-12 and V-16 engines sometimes renders scraping impracticable. Burning the carbon, if properly done, will give good results on these engines at a much lower cost to the owner.

If this method is used, the carbon should be allowed to burn slowly to obtain the best possible results. Quick burning will do only a partial job. The rate of combustion can be controlled by the proper regulation of the oxygen supply to the combustion chamber.

While the carbon is being burned, particular care must be taken to prevent injury either to the valves or to the external fittings on the engine. The proper procedure is as follows:

Remove the spark plug wires and distributor cover, or use a suitable asbestos cover plate to protect them during the burning operation.

Remove all spark plugs.

The next step is a matter of extreme importance, that is, to be sure the valves are both closed on the cylinder being burned. If the valves are not closed, they are very likely to be overheated, causing them to warp.

The only positive way to make sure the valves are closed is to use a test light and crank the engine to the firing point on that cylinder. See Fig. 4, Plate 30.

Allow the carbon to burn slowly until it has all been burned.

Burn out all of the left hand cylinders first, in the order in which they fire; then burn the right hand cylinders. The firing order, is, of course, indicated on the distributor cover.

Removal of carbon in the V-8 engines should be done by scraping as in the past.

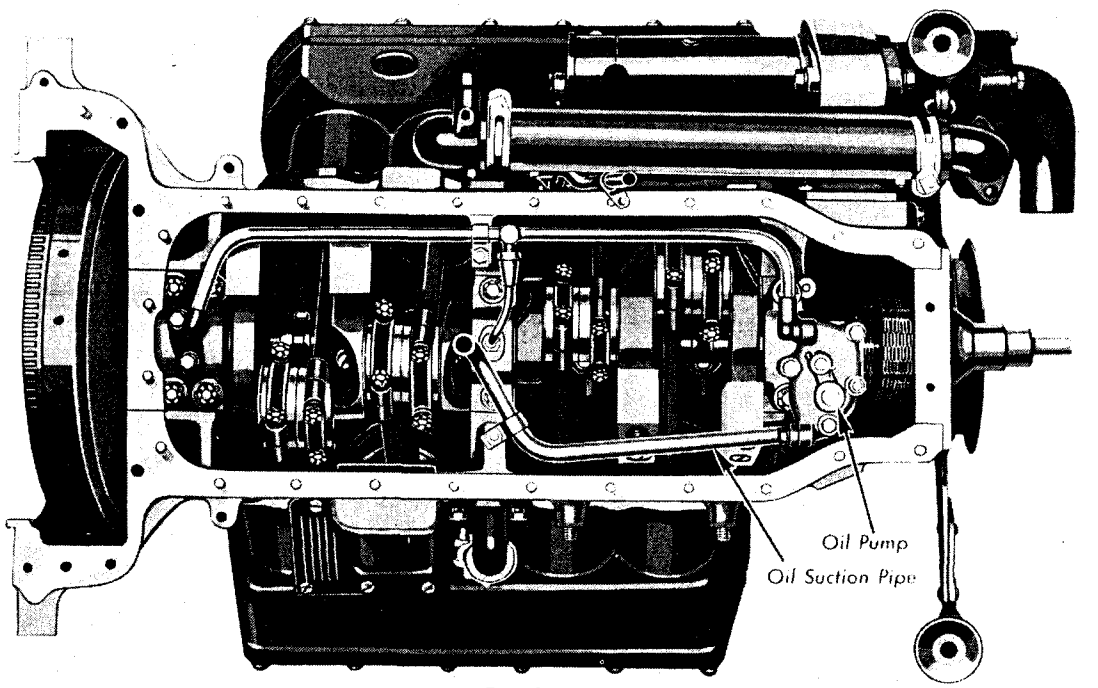
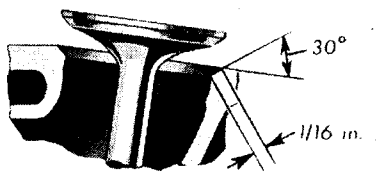
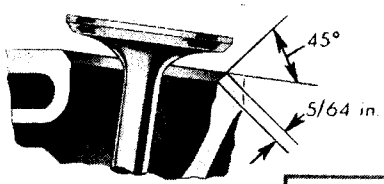


Fig. 1
Bottom View of Engine With Oil Pan Removed.

Connecting rod and piston assemblies can be removed through bottom of crankcase without disturbing cylinder heads



Clear Diameter of Inlet Valve-1-1/2 in.



Clear Diameter of Exhaust Valve-1-1/2 in.

Fig. 2
Valve Specifications

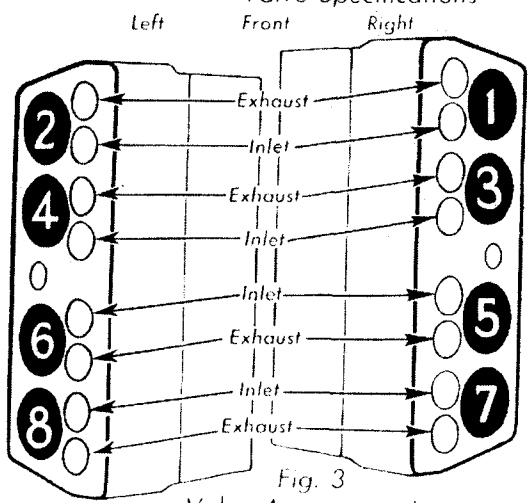
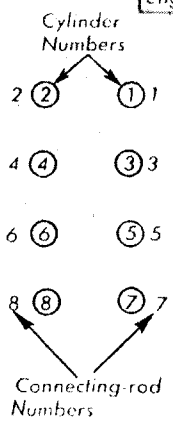


Fig. 3
Valve Arrangement



Note:
Lubricate cam slides before installing in engine.

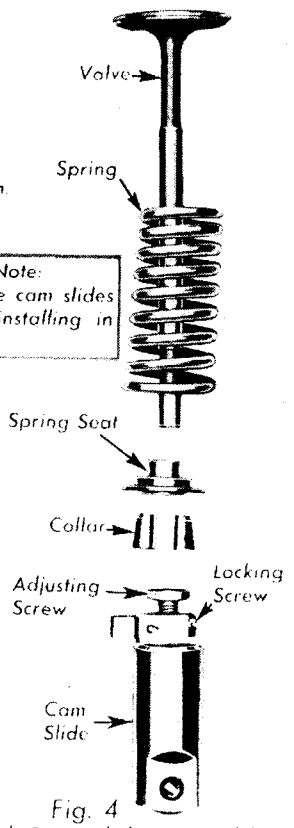


Fig. 4
Valve and Cam Slide Assembly

Plate 27. Bottom View of Engine and Valve Details—Cadillac 355-B—LaSalle 345-B

12. Fitting Oil Rings

In fitting new rings, the edge clearance should be from perfectly free to a clearance of .002 in. maximum, measured with a .002-in. feeler inserted opposite the solid section of the ring. The ring must be pressed into the groove when this measurement is taken.

13. Servicing the Vacuum Pump

Service on the vacuum pump can be obtained from A. C. service stations. However, replacement of the valves and the diaphragm can be accomplished simply by taking the pump apart. Do not under any circumstances separate the two parts of the housing without holding the pump head securely because the pressure of the diaphragm return spring is approximately 75 lbs. If care is not taken in removing the screws which hold the pump together, the top will fly off and possibly cause serious personal injury to some one.

14. Care of Valve Silencers

The automatic valve silencers used on the 370-B and 452-B cars are built to very close limits. The mechanism must, therefore, be kept clean and free from particles of carbon and other foreign matter.

Whenever the valve cover is removed and the valve silencers are exposed, they should be covered to prevent dust and dirt from lodging on the mechanism and finding its way into the dashpots. Small particles of dirt or carbon becoming lodged in the mechanism may cause noisy operation.

Other possible causes for improper operation of the valve silencers are:

1. Leakage of the check valve.
2. Incorrect clearance between the plunger and the cylinder walls.
3. Damage due to improper installation.

Leakage of the check valve in the plunger is most generally due to particles of foreign matter being lodged on the seat of the valve. This can ordinarily be corrected by washing it carefully with gasoline and blowing it out with compressed air.

To assure the check valve being seated properly, it should be revolved on its seat by hand.

Incorrect clearance between the plunger and the cylinder wall may result from the interchanging of the plungers. It should be noted that the plungers and dashpots are marked to insure correct assembly. The number of marks etched on the plunger should correspond with the number of marks appearing on the dashpot casting.

15. Valve Adjustment

Beginning with engine unit 11-1148 on 345-B and 12-1126 on 355-B cars a camshaft with a new contour is used. This camshaft calls for a different setting of the valve stem clearance and may be identified by a "Z" in a circle stamped on the hub of the front bearing. When the camshaft is in the engine, this mark can be seen through the opening in the crankcase after removing the distributor mounting support.

On cars with the earlier type camshaft before these engine unit numbers the valve tappets should be adjusted to .004 for inlet valves and .006 for exhaust valves.

On cars with the latter type camshaft the clearance should be .006 for inlet valves and .008 for exhaust valves.

The Parts Division will supply only the second type camshaft for replacement.

Valve clearances should be adjusted while the engine is cold. Valves should always be readjusted after tightening cylinder block hold down nuts.

Valve adjustments should be made very carefully. A careless adjustment may cause a variation of 10° in valve timing.

Service men must watch the order of the inlet and exhaust valves on the 345-B and 355-B engines both when adjusting and when grinding valves, as it differs from that previously used on V-8 engines. This new valve arrangement is shown in Fig. 3, Page 27.

Engine Speeds

Engine Speeds in Revolutions per Minute for Various Gear Ratios and Rolling Radii at a Car Speed of 60 Miles per Hour

Rear Axle Gear Ratio	Rolling Radius of Tire	Engine Speed in R. P. M.	Rear Axle Gear Ratio	Rolling Radius of Tire	Engine Speed in R. P. M.
4.31 to 1	14¼	3055	4.60 to 1—Continued	15¾	2950
	14½	3000		16	2905
	14¾	2950		16¼	2860
	15	2900		16½	2815
	15¼	2850		16¾	2770
	15½	2805		17	2730
	15¾	2760	4.64 to 1	14¼	3290
	16	2720		14½	3230
	16¼	2680		14¾	3175
	16½	2640		15	3120
	16¾	2600		15¼	3070
	17	2560		15½	3025
4.36 to 1	14¼	3090		15¾	2975
	14½	3035		16	2925
	14¾	2985		16¼	2885
	15	1935		16½	2840
	15¼	2885		16¾	2795
	15½	2840		17	2750
	15¾	2795	4.80 to 1	14¼	3400
	16	2750		14½	3340
	16¼	2710		14¾	3285
	16½	2670		15	3230
	16¾	2630		15¼	3175
	17	2590		15½	3125
4.60 to 1	14¼	3260		15¾	3075
	14½	3200		16	3025
	14¾	3150		16¼	2980
	15	3095		16½	2935
	15¼	3045		16¾	2890
	15½	3000		17	2850

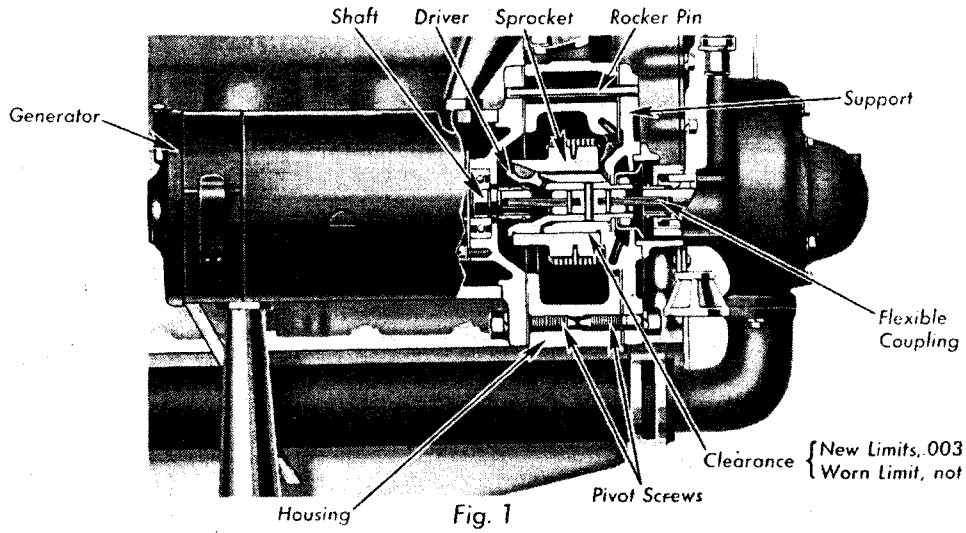


Fig. 1
Sectional View of Generator and Water Pump Drive

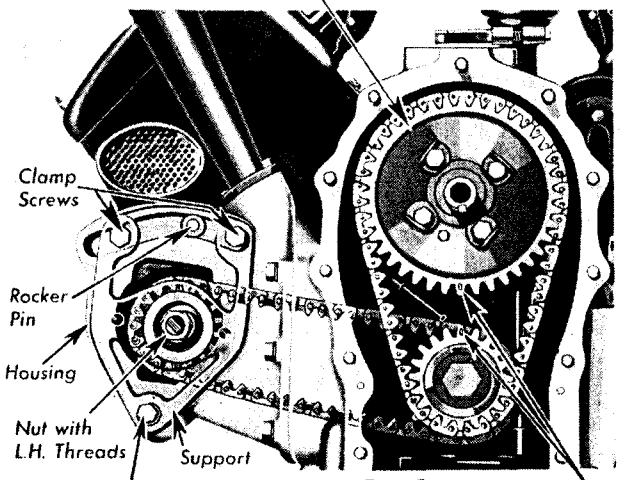


Fig. 2
Front End Chains

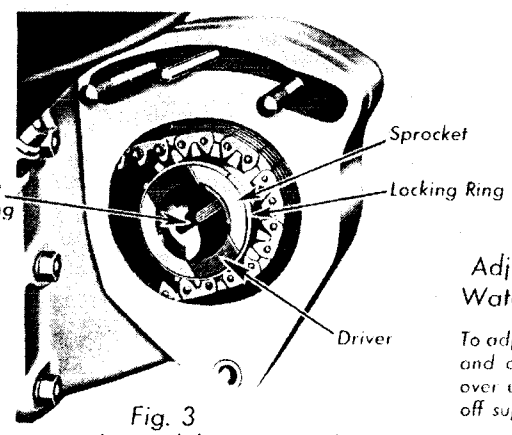


Fig. 3
Remove sprocket and driver through rear opening.

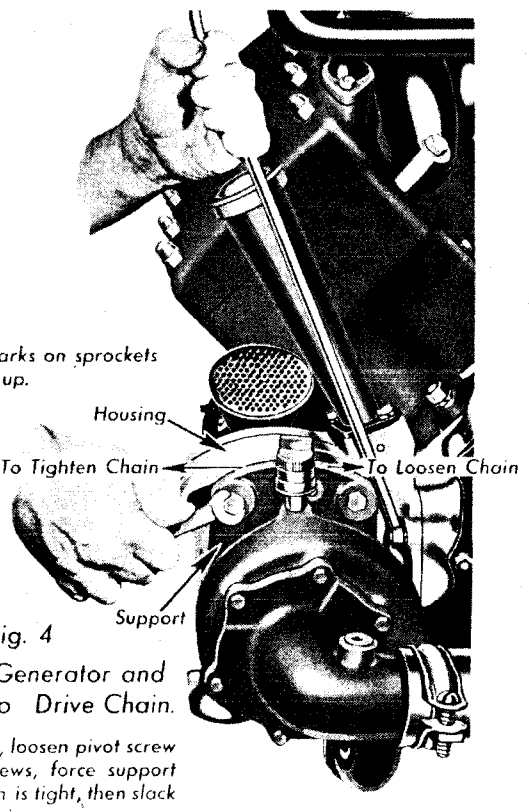


Fig. 4
Adjusting Generator and Water Pump Drive Chain.

To adjust chain, loosen pivot screw and clamp screws, force support over until chain is tight, then slack off support 1/8 in.

Plate 28. Generator and Water Pump Drive—Cadillac 355-B—LaSalle 345-B

ENGINE—Specifications

Subject and Remarks	LaSalle	Cadillac		
	345-B	355-B	370-B	452-B
Angle between cylinder blocks	90°	90°	45°	45°
Bore	3 3/8"	3 3/8"	3 1/8"	3"
Compression ratio—				
Standard	5.37 to 1	5.37 to 1	5.35 to 1	5.35 to 1
Optional	5.7 to 1	5.7 to 1	5.08 to 1	5.08 to 1
Horsepower—				
Rated (taxable)	36.45	36.45	46.9	57.5
Developed at 3000 R. P. M.	115	115	.....	.....
Developed at 3400 R. P. M.	.....	.....	135	165
Model	345-B	355-B	370-B	452-B
Stroke	4 13/16"	4 15/16"	4"	4"
Piston displacement in cubic inches	353	353	368	452
Points of suspension, number of	6	6	6	6
Valve arrangement	L-head	L-head	I-overhead	I-overhead
Camshaft (See Note 1)				
Bearing clearance				
New limits	.0027-.0037"	.0027-.0037"	.0011-.0026"	.0011-.0026"
Worn limits, not over	.005"	.005"	.005"	.005"
Bearings out of round, not over	.005"	.005"	.005"	.005"
Diameter and length of bearings—				
No. 1 (front)	1 1/8 x 1.802"	1 1/8 x 1.802"	2 x 3"	2 x 3"
No. 2	2.3392 x 1.00"	2.3392 x 1.00"	2 1/8 x 1 3/8"	2 1/8 x 1 3/8"
No. 3	2.3392 x 1 1/8"	2.3392 x 1 1/8"	2 1/8 x 1 3/8"	2 1/8 x 1 3/8"
No. 4 (rear except on 452-B)	1 5/8 x 1 11/16"	1 5/8 x 1 11/16"	2 1/8 x 2 15/16"	2 1/8 x 1 3/8"
No. 5 (rear 452-B)	.....	.....	.....	2 1/8 x 2 15/16"
End play in camshaft				
New limits	.005-.015"	.005-.015"	.004-.008"	.004-.008"
Worn limit, not over	.020"	.020"	.015"	.015"
Number of bearings	4	4	4	5
Removing camshaft (See Note 2)	.....	.....	.....	.....
Chains				
Camshaft chain—				
Adjustment	None	None	Automatic	Automatic
Number of links	54	54	110	110
Pitch	1/2"	1/2"	3/8"	3/8"
Type—Morse No.	766	766	766 Duplex	766 Duplex
Width	1 3/4"	1 3/4"	1 1/2"	1 1/2"
Generator and water pump drive chain				
Adjustment				
Slack measured at top of sprocket housing	1/8"	1/8"	.....	.....
Number of links	58	58		
Pitch	1/2"	1/2"	Only one chain used. See "Camshaft Chain" for details.	
Type—Morse No.	766	766		
Width	1 1/4"	1 1/4"	.....	.....
Connecting Rods				
Alignment (See Note 3)	.....	.....	.....	.....
Assembly (See Note 4)	.....	.....	.....	.....
Center to center length	10 1/2"	10 1/2"	9 1/4"	9 1/4"
Clearance between—				
Bushing and piston pin (See Note 5)	.....	.....	.....	.....
Lower bearing and crank pin (See Note 6)				
New limits	.001-.0025"	.001-.0025"	.001-.0025"	.001-.0025"
Worn limit, not over	.006"	.006"	.006"	.006"
Diameter and length of connecting rod bearings	2 3/8 x 1 3/8"	2 3/8 x 1 3/8"	2 1/2 x 1 1/8"	2 1/2 x 1 1/8"
End play in lower bearing				
New limits	.006-.012"	.006-.012"	.006-.012"	.006-.012"
Worn limit, not over	.015"	.015"	.015"	.015"
Piston pin lubrication	.....	.....	.....	.....
Force feed—connecting rods rifle-bored.				
Removing and installing piston pin bushing (See Note 7)	.....	.....	.....	.....
Crankshaft and Main Bearings				
Crank pin diameter	2.375"	2.375"	2.500"	2.500"
Crank pin out of round, not over	.004"	.004"	.004"	.004"
Diameter and length of main bearing journals—				
No. 1 (front)	2 3/8 x 1 15/16"	2 3/8 x 1 15/16"	2 5/8 x 2 3/16"	2 5/8 x 2 3/16"
No. 2	2 3/8 x 1 5/8"	2 3/8 x 1 5/8"	2 5/8 x 1 3/8"	2 5/8 x 1 3/8"
No. 3 (rear on 345-B, 355-B)	2 3/8 x 2 7/8"	2 3/8 x 2 7/8"	2 5/8 x 1 1/2"	2 5/8 x 1 1/2"
No. 4 (rear on 370-B)	.....	.....	2 5/8 x 3 9/16"	2 5/8 x 1 3/8"
No. 5 (rear on 452-B)	.....	.....	.....	2 5/8 x 3 9/16"
Diameter and length of crankpin journal	2 3/8 x 2 3/4"	2 3/8 x 2 3/4"	2 1/2 x 2 1/4"	2 1/2 x 2 1/4"

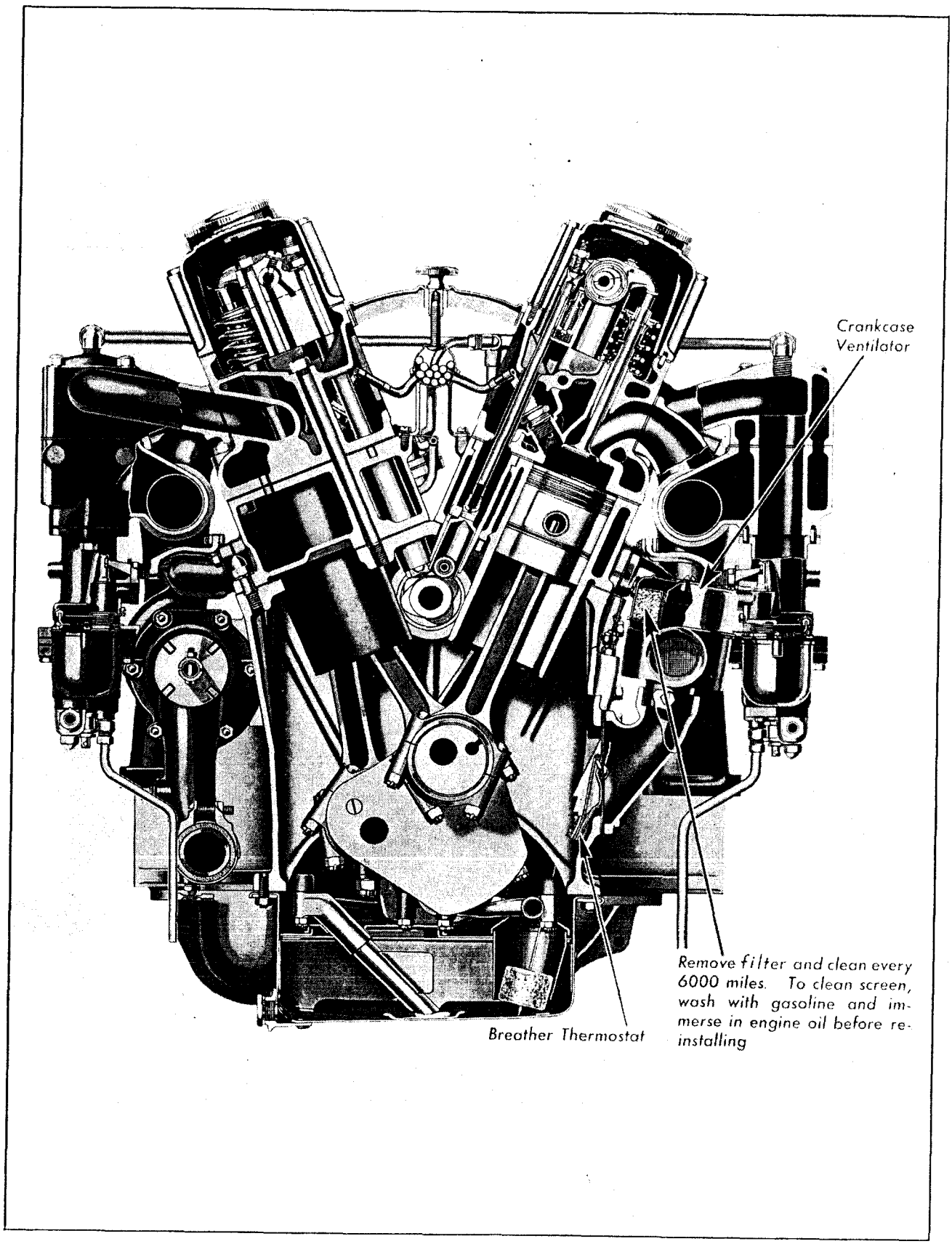


Plate 29. Cross-sectional View of Cadillac 370-B. Typical of Cadillac 452-B except Number of Cylinders

ENGINE—Specifications

Subject and Remarks	LaSalle	Cadillac		
	345-B	355-B	370-B	452-B
Crankshaft and Main Bearings—Cont'd				
End play in crankshaft				
New limits	.001-.005"	.001-.005"	.001-.005"	.001-.005"
Worn limit, not over	.010"	.010"	.010"	.010"
Harmonic balancer used	No	No	Yes	Yes
Length of crankshaft—overall	28 25/32"	28 25/32"	35 13/16"	44 5/16"
Length of crankshaft—front to rear bearings inclusively	23 25/32"	23 25/32"	30 25/32"	39 9/32"
Main bearing clearance (See Note 8)				
New limits	.001-.0015"	.001-.0015"	.001-.0015"	.001-.0015"
Worn limit, not over	.004"	.004"	.004"	.004"
Main bearing journal out of round, not over	.005"	.005"	.005"	.005"
Number of main bearings	3	3	4	5
Lubrication				
Crankcase capacity	8 qts.	8 qts.	9 qts.	10 qts.
Thinning lubrication with kerosene	.....	.....	.....	.....
See Lubrication Section.				
Oil Filter				
Make	A. C.	A. C.	Cuno	Cuno
Cartridge type	A. C.	A. C.	.....	.....
Cartridge replacement (See Note 9)	12,000 mi.	12,000 mi.	.....	.....
Remove and clean oil pan and screen at same time.				
Oil Pump				
Backlash between spiral drive gears, not over	.018"	.018"	.018"	.018"
Clearance between—				
Bushing and drive shaft				
New limits	.001-.0025"	.001-.0025"	.001-.0025"	.001-.0025"
Worn limits, not over	.010"	.010"	.010"	.010"
Idler gear bushing and shaft				
New limits	.001-.0025"	.001-.0025"	.001-.0025"	.001-.0025"
Worn limit, not over	.005"	.005"	.005"	.005"
Pump body and gears				
New limits	.003-.005"	.003-.005"	.003-.005"	.003-.005"
Worn limit, not over	.008"	.008"	.008"	.008"
End play in pump gears				
New limits	.003-.008"	.003-.008"	.002-.004"	.002-.004"
Worn limit, not over	.020"	.020"	.015"	.015"
End play in spiral gear on drive shaft				
New limits	.005-.015"	.005-.015"	.009-.015"	.009-.015"
Worn limit, not over	.020"	.020"	.020"	.020"
Gasket thickness, pump cover	.009-.011"	.009-.011"	.....	.....
Pressure Regulator				
Adjustment	None	None	None	None
Clearance between plunger and housing				
New limits	.003-.006"	.003-.006"	.003-.006"	.003-.006"
Worn limit, not over	.008"	.008"	.008"	.008"
Pressure, normal when oil is warm—				
30 M.P.H.	30 lbs.	30 lbs.	.....	.....
60 M. P. H.	.....	.....	30 lbs.	30 lbs.
Spring				
Free length (approximately)	1¾"	1¾"	1¾"	1¾"
Pressure at 1 5/16 in.	1 lb. 14 oz.-2 lb. 2 oz.	1 lb. 14 oz.-2 lb. 2 oz.	1 lb. 14 oz.-2 lb. 2 oz.	1 lb. 14 oz.-2 lb. 2 oz.
Valve opens at	11 lbs.	11 lbs.	14 lbs.	14 lbs.
Pistons and Cylinders				
Cylinder bore out of round, not over	.001"	.001"	.001"	.001"
Piston out of round, not over	.001"	.001"	.001"	.001"
Piston clearance at top land, not less than	.016"	.016"	.012"	.0125"
Piston clearance at skirt (See Note 10)—new limit	.0023-.0028"	.0023-.0028"	.0023-.0028"	.0028-.0033"
Cylinder bore, standard	3 3/8"	3 3/8"	3 1/8"	3"
All bores in same block are held within .002 in. of each other.				
Cylinder bore oversize	.....	.....	.....	.....
Oversize cylinders are honed to fit the pistons with which they are supplied.				
Carbon burning (See Note 11)	.....	.....	.....	.....

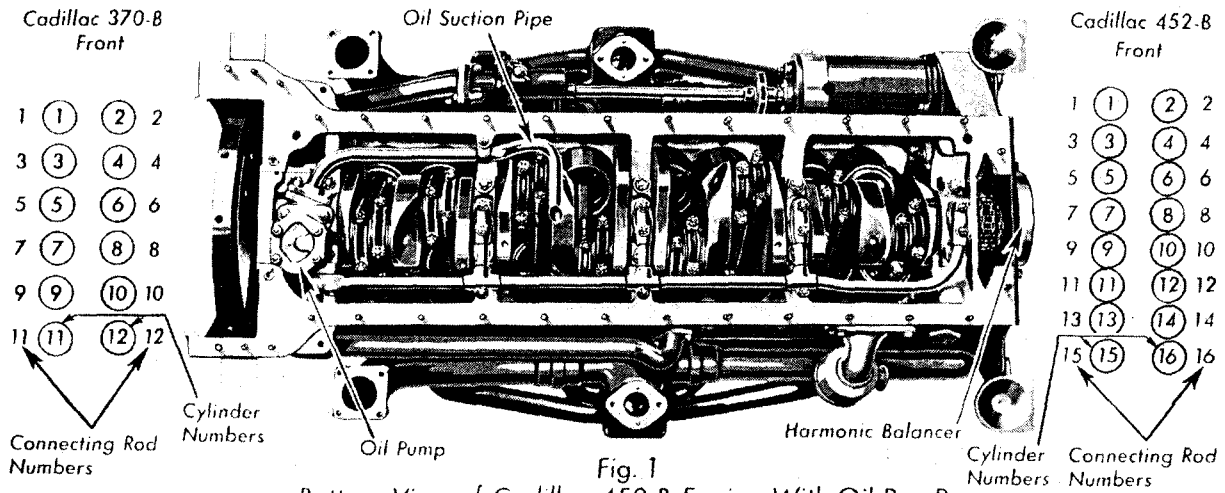


Fig. 1

Bottom View of Cadillac 452-B Engine With Oil Pan Removed. Typical of 370-B which has four less cylinders.

Connecting-rod and piston assemblies can be removed through bottom of crankcase without disturbing cylinder heads.

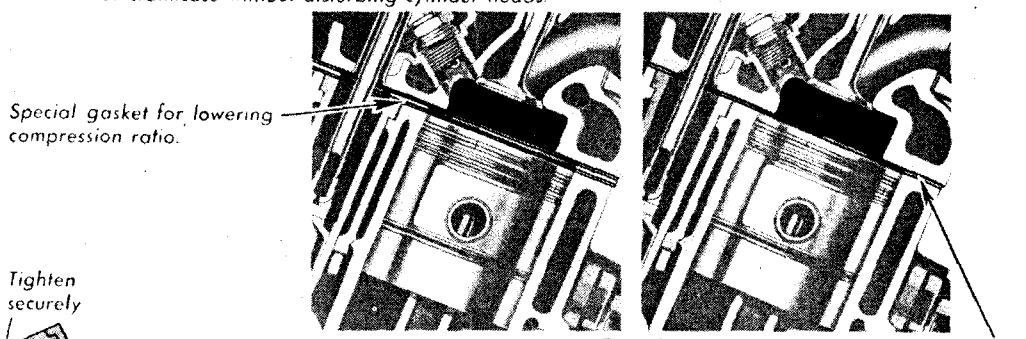


Fig. 2

The compression ratio is lowered by using a special cylinder head gasket having a metal insert.

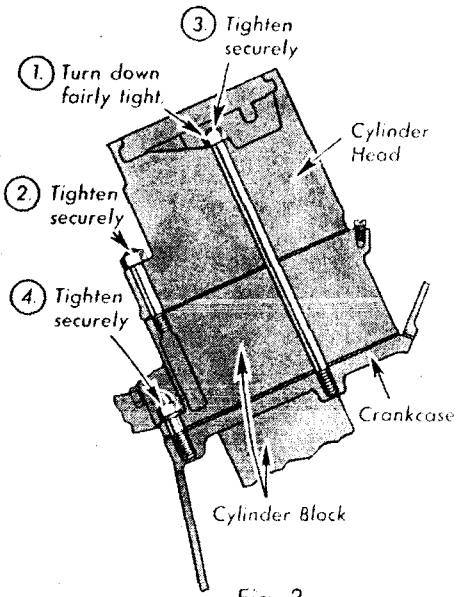


Fig. 3

Order for tightening stud nuts on 370-B and 452-B cylinder heads.

Tighten nuts in each row gradually.

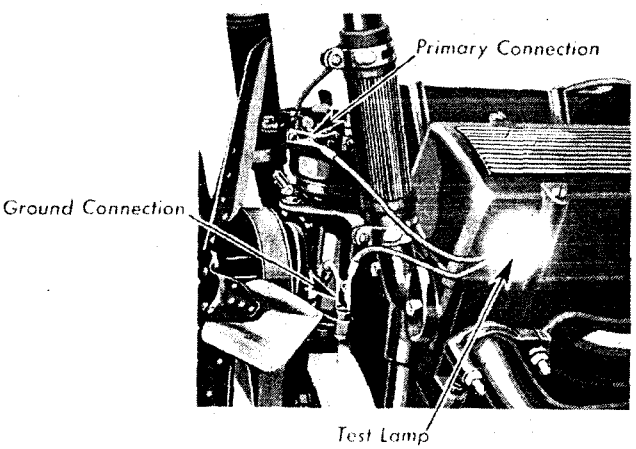


Fig. 4

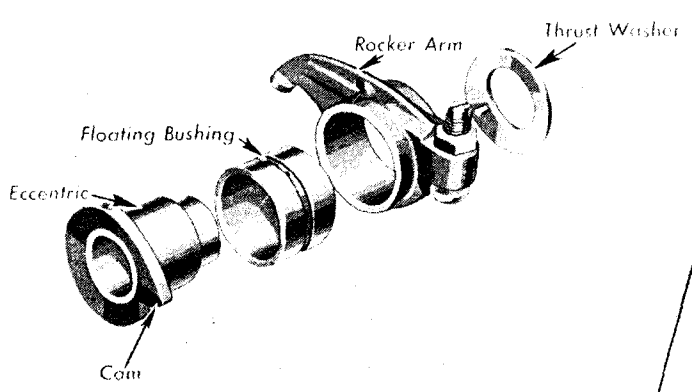
Locating firing center with test lamp for burning carbon.

Make sure both valves are closed by cranking engine until lamp lights with spark control in retarded position.

Plate 30. Bottom View of Engine and Cylinder Details—Cadillac 370-B and 452-B

ENGINE—Specifications

Subject and Remarks	LaSalle	Cadillac		
	345-B	355-B	370-B	452-B
Pistons and Cylinders—Cont'd				
Limits on pistons				
Standard No. 1 on V-8—A on 370-B and 452-B	3.372-3.3725"	3.372-3.3725"	3.1225-3.123"	2.9970-2.9975"
No. 2 on V-8—B on 370-B and 452-B	3.3725-3.3730"	3.3725-3.3730"	3.123-3.1235"	2.9975-2.9980"
No. 3 on V-8—C on 370-B and 452-B	3.3730-3.3735"	3.3730-3.3735"	3.1235-3.1240"	2.9980-2.9985"
No. 4 on V-8—D on 370-B and 452-B	3.3735-3.3740"	3.3735-3.3740"	3.1240-3.1245"	2.9985-2.9990"
Marked "STD No. 1" etc.—measured at bottom of skirt.				
Piston Pins				
Clearance between—				
Pin and bushing (See Note 5)	.....	.....	.....	.....
Pin and piston (See Note 5)	.....	.....	.....	.....
Diameter—standard	7/8"	7/8"	7/8"	7/8"
Piston Rings				
Clearance between ring and sides of grooves in piston				
New limits	.0011-.0026"	.0011-.0026"	.0011-.0026"	.0011-.0026"
Worn limit, not over	.004"	.004"	.004"	.004"
Gap between ends				
New limits				
Compression rings	.005-.010"	.005-.010"	.005-.010"	.005-.010"
Oil rings	.003-.011"	.003-.011"	.003-.011"	.003-.011"
Worn limit, not over	.025"	.025"	.025"	.025"
Number of compression rings	2	2	2	3
Number of oil rings (See Note 12)	2	2	2	1
Install oil rings with chamfer at top.				
Width of rings—				
Upper compression	3/16"	3/16"	3/16"	3/16"
Lower compression (Two on 452-B)	1/8"	1/8"	1/8"	.....
Upper oil	5/32"	5/32"	1/8"	.....
Lower oil	3/16"	3/16"	3/16"	3/16"
Engine unit number location	.....	.....	.....	.....
All models—left rear engine support.				
Vacuum Pump Service				
(See Note 13)	.....	.....	.....	.....
Valve Mechanism				
Clearance between—				
Camslide and guide				
New limits	.001-.0025"	.001-.0025"	.001-.0025"	.001-.0025"
Worn limits, not over	.005"	.005"	.005"	.005"
Camslide roller and pin				
New limits	.0017-.003"	.0017-.003"	.0017-.003"	.0017-.003"
Worn limit, not over	.004"	.004"	.004"	.004"
Furnished only in complete assemblies of camslide with button, roller and screw.				
Valve Silencers, care of (See Note 14)	.....	.....	.....	.....
Valves, Exhaust				
Clearance between—				
Stem and guide				
New limits	.0025-.0045"	.0025-.0045"	.001-.0025"	.001-.0025"
Worn limit, not over	.006"	.006"	.005"	.005"
Stem and camslide (See Note 15)	.....	.....	Automatic	Automatic
Before engine unit 11-1148	.006"	.....	.....	.....
Beginning engine unit 11-1148	.008"	.....	.....	.....
Before engine unit 12-1126	.....	.006"	.....	.....
Beginning engine unit 12-1126	.....	.008"	.....	.....
Adjust while engine is cold.				
Clear diameter (port opening)	1 1/2"	1 1/2"	1 5/16"	1 5/16"
Length—overall	6 1/2"	6 1/2"	6 9/64"	6 9/64"
Lift	23/64"	23/64"	11/32"	11/32"
Material	Silchrome steel	Silchrome steel	Silchrome steel	Silchrome steel
Seat angle	45°	45°	45°	45°
Seat width	5/64"	5/64"	5/64"	5/64"
Stem diameter	3/8"	3/8"	11/32"	11/32"



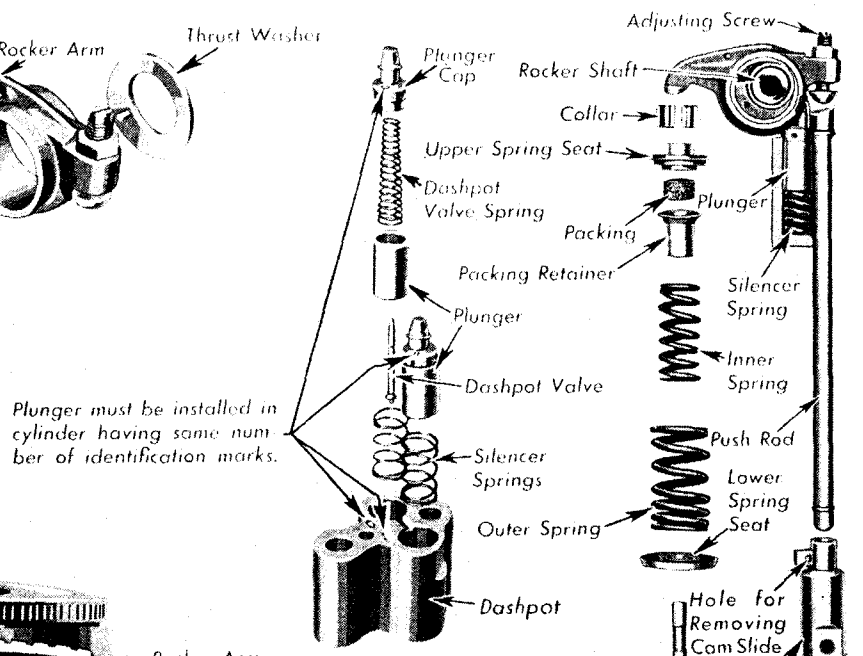


Fig. 2
Valve Silencer and Rocker Arm Disassembled

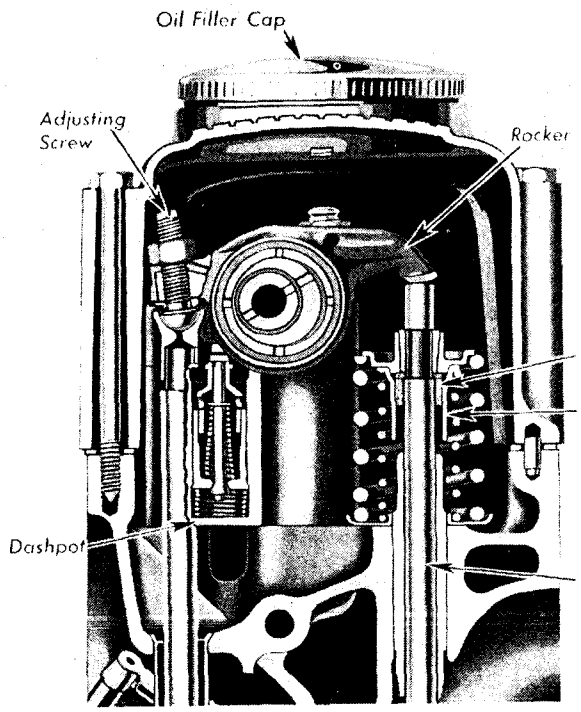
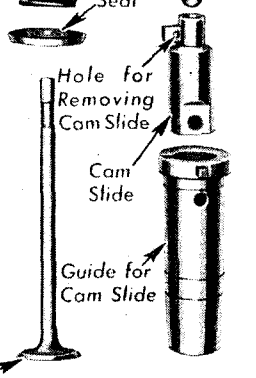


Fig. 1
Sectional View of Valve Operating Mechanism

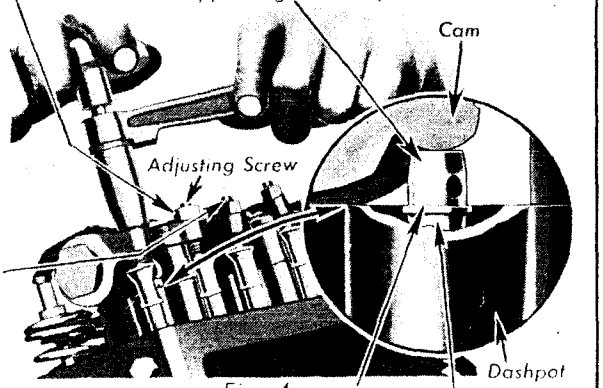


Note:
Lubricate cam slide before installing in engine.

Fig. 3
Valve and Cam Slide Disassembled

① Loosen lock nut to adjust valve clearance. Tighten after adjustment is made.

② Push plunger down until bottom of hole is on level with or slightly below upper edge of dashpot.



③ Turn adjusting screw down until all clearance is taken up at both ends of rocker arm. Release plunger and back off adjusting screw to locate plunger in correct position.

Fig. 4
Valve Adjusting
Back off adjusting screw until shoulder on plunger is flush with dashpot.

Plate 31. Valve Details—Cadillac 370-B and 452-B

ENGINE—Specifications

Subject and Remarks	LaSalle	Cadillac		
	345-B	355-B	370-B	452-B
Valves, Inlet				
Clearance between—				
Stem and guide				
New limits	.0015-.0035″	.0015-.0035″	.001-.0025″	.001-.0025″
Worn limit, not over	.006″	.006″	.006″	.006″
Stem and camslide (See Note 15)	.....	.....	Automatic	Automatic
Before engine unit 11-1148	.004″	.....	.....	.....
Beginning engine unit 11-1148	.006″	.....	.....	.....
Before engine unit 12-1126	.....	.004″	.....	.....
Beginning engine unit 12-1126	.....	.006″	.....	.....
Adjust while engine is cold.				
Clear diameter (port opening)	1½″	1½″	1 5/16″	1 5/16″
Length—overall	6 17/32″	6 17/32″	6 9/64″	6 9/64″
Lift	23/64″	23/64″	11/32″	11/32″
Material	Tungsten steel	Tungsten steel	Tungsten steel	Tungsten steel
Seat angle	30°	30°	45°	45°
Seat width	1/16″	1/16″	5/64″	5/64″
Stem diameter	3/8″	3/8″	11/32″	11/32″
Valves Springs				
Free length—				
Inner valve spring	.....	.....	1.944″	1.944″
Outer valve spring	2.800-2.820″	2.800-2.820″	2.215-2.235″	2.347-2.378″
Pressure in pounds, inner valves—				
Compressed to 1.751 in. (valve closed)	.....	.....	18-21 lbs.	18-21 lbs.
Compressed to 1.407 in. (valve open)	.....	.....	49-54 lbs.	49-54 lbs.
Pressure in pounds, outer valves—				
Compressed to 2.5 in. (valve closed)	77-81 lbs.	77-81 lbs.	.....	.....
Compressed to 1.922 in. (valve closed)	.....	.....	48-52 lbs.	.....
Compressed to 1.875 in. (valve closed)	.....	.....	.....	42-47 lbs.
Compressed to 2.148 in. (valve open)	164-178 lbs.	164-178 lbs.	.....	.....
Compressed to 1.578 in. (valve open)	.....	.....	111-120 lbs.	.....
Compressed to 1.531 in. (valve open)	.....	.....	.....	87-92 lbs.
Spring must not show any set when compressed with coils touching.				
Valve Timing				
Intake opens—before top center (.006 in. clearance on 345B, 355B)	6°	6°	T. D. C.	T. D. C.
Intake closes—after bottom center (.006 in. clearance on 345-B, 355-B)	42°	42°	44°	44°
Exhaust opens—before bottom center (.008 in. clearance on 345-B, 355-B)	38°	38°	39°	39°
Exhaust closes—after top center (.008 in. clearance on 345B, 355B)	2°	2°	5°	5°

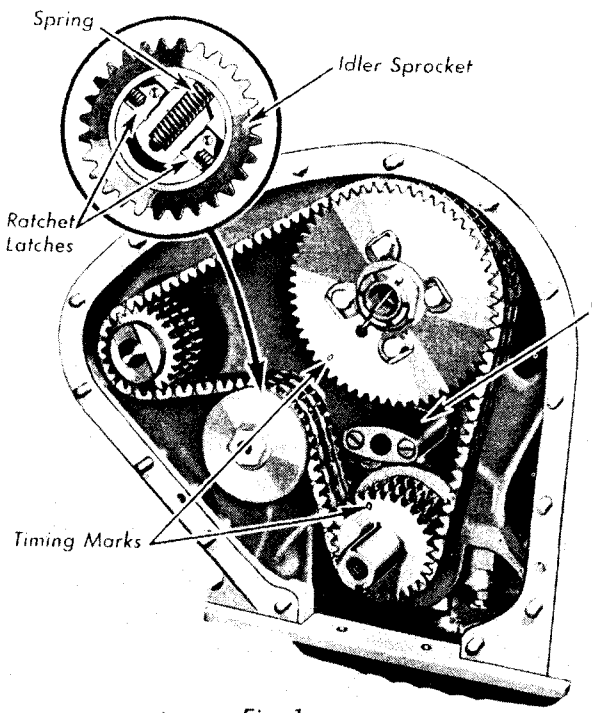


Fig. 1
Slack in timing chain is taken up by idler sprocket moving toward camshaft

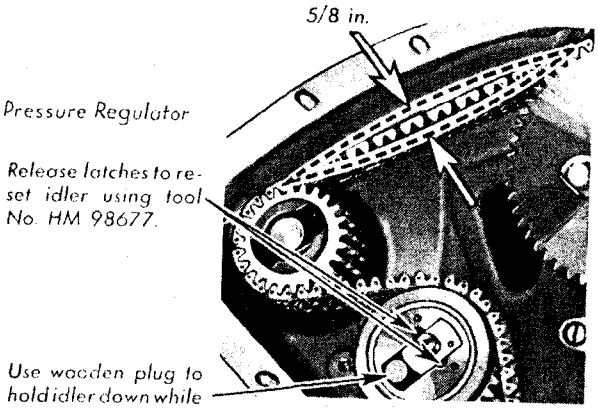


Fig. 2
Resetting Chain Adjuster

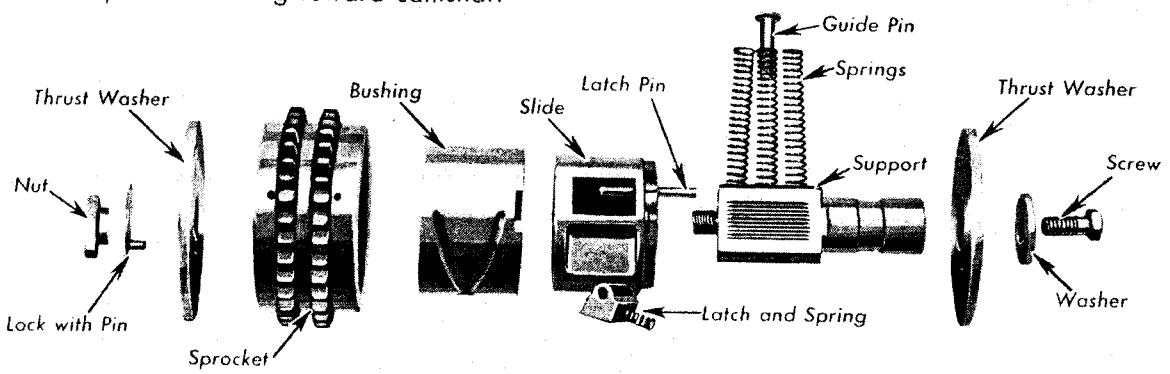


Fig. 3
Exploded View of Automatic Chain Adjuster

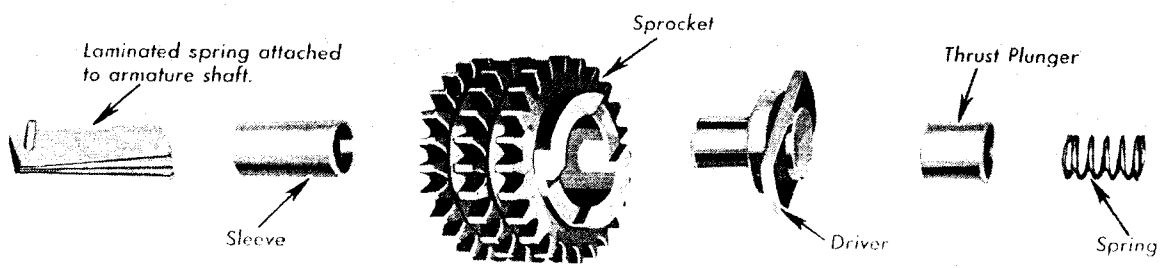


Fig. 4
Exploded View of Generator Driver

Plate 32. Front End Drive Cadillac 370-B and 452-B

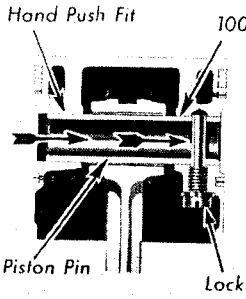


Fig. 1

Removal of Piston Pin

Always remove and install piston pin in direction indicated by arrows.

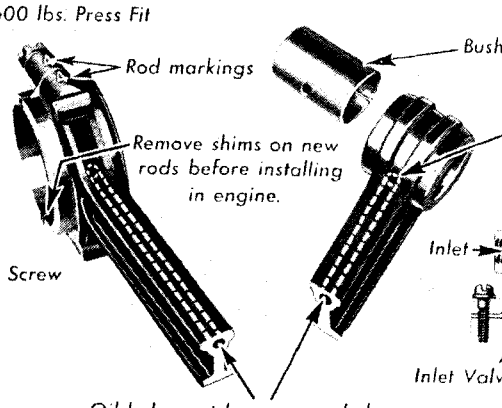


Fig. 2

Connecting rods for all models are rifle bored for lubrication of piston pin.

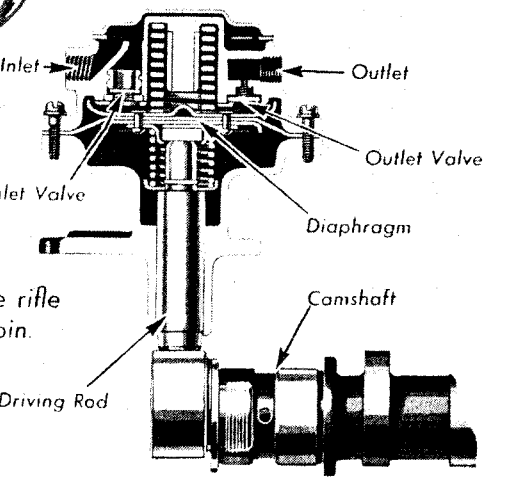


Fig. 3

Sectional View of Vacuum Pump and Drive

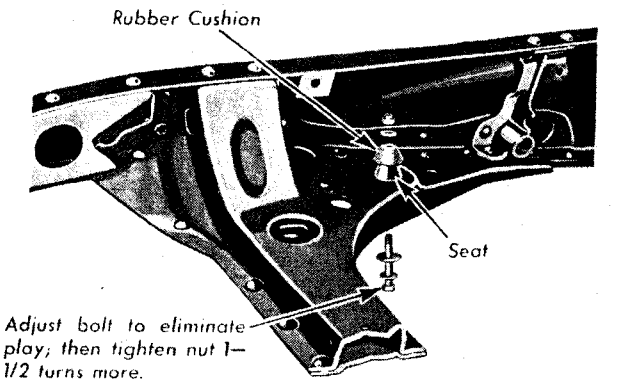


Fig. 4

Front Engine Support

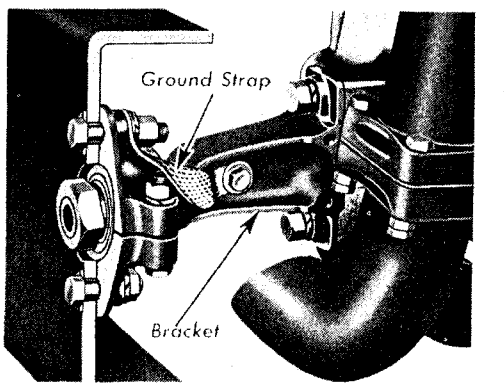


Fig. 5

Rear Engine Support. Typical of all models.

For transmission rear support see Plate 54, Fig. 3, in Transmission Section.

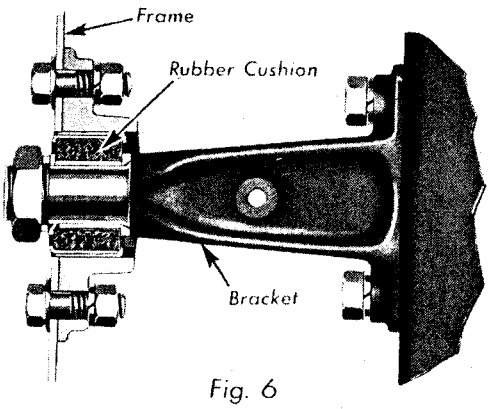


Fig. 6

Sectional View of Rear Engine Support

Plate 33. Piston and Connecting Rod, Vacuum Pump and Engine Mounting

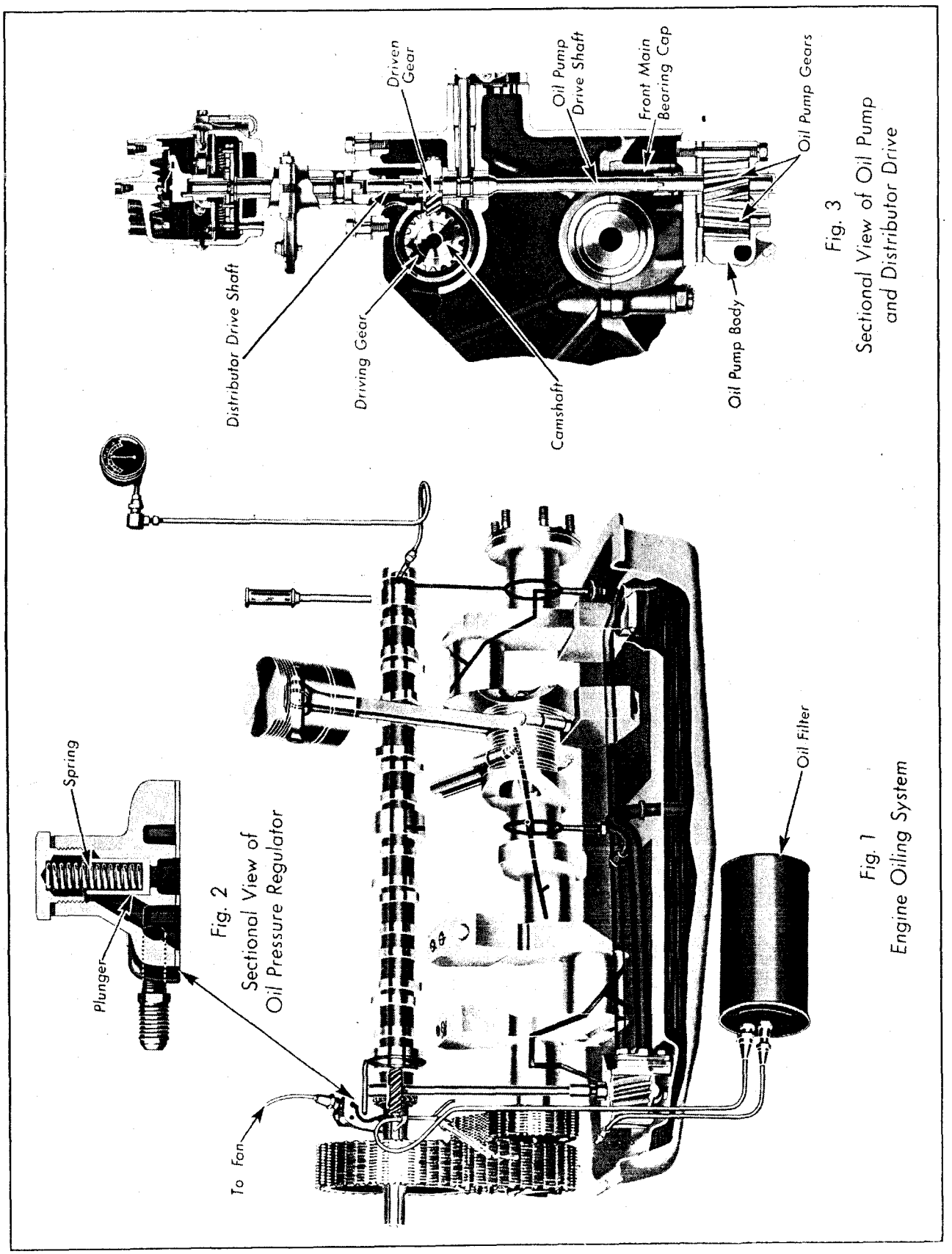


Fig. 3
Sectional View of Oil Pump and Distributor Drive

Fig. 2
Sectional View of Oil Pressure Regulator

Fig. 1
Engine Oiling System

Plate 34. Oiling System—Cadillac 355-B—LaSalle 345-B

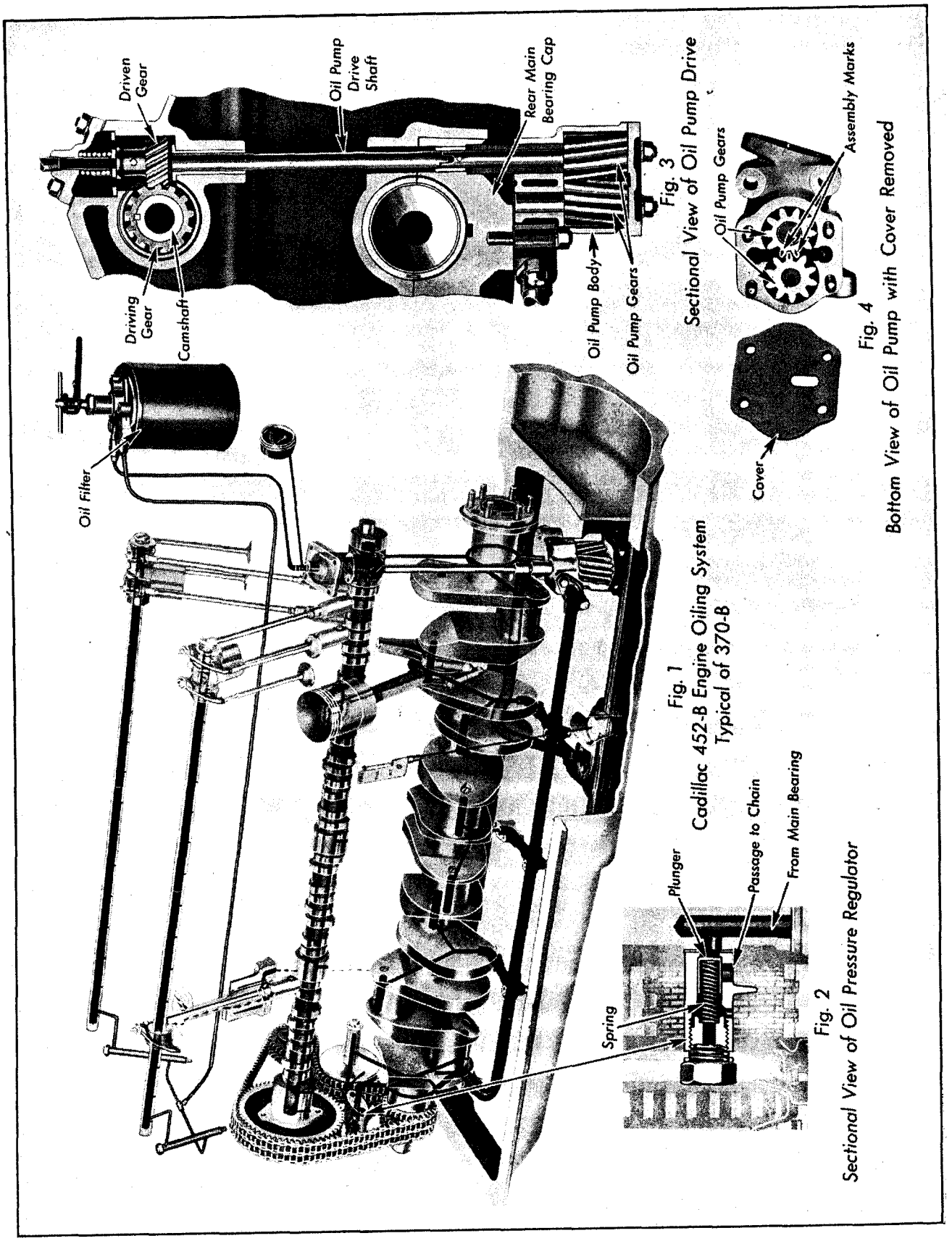


Plate 35. Oiling System—Cadillac 452-B, Typical of 370-B

ENGINE—Service Information

16. Compression Ratios

The compression ratios of the 370-C and 452-C engines as shown below are greater than on the corresponding "B" series engines

H. C. (Optional)	H. H. C. (Standard)
370-C—5.4 to 1	5.6 to 1
452-C—5.4 to 1	5.7 to 1

The increase in compression ratios necessitates a change in the ignition timing, and the flywheel marks have been changed accordingly. That is, the IG/A marking on the 370-C and 452-C is 4° or approximately ½ in. ahead of center.

The compression ratio of the 370-C and 452-C engines can be altered the same as in the "B" models by changing the cylinder head gaskets. See Note 17.

17. Interchangeability of 370 and 452 Cylinder Heads and Gaskets

The cylinder heads provided on 370-C and 452-C cars are designated HHC and the lower compression ratios are obtained by the use of special gaskets in the same way as on 370-B and 452-B cars. The "C" series head is interchangeable on "A," "B" and "C" series cars and only the "C" series heads will be supplied by the Factory Parts Division for all 370 and 452 cars. The part numbers of the "C" series heads are 1096172 for 370 cars and 1096173 for 452 cars. These heads can be identified by the letter "C" in a circle stamped under the "HHC." On later cars the "HHC" is eliminated and the letter "C" in a circle is the only mark appearing.

The earlier type heads should not be used on "C" series cars since the "C" series heads are of a considerably higher compression ratio than the heads formerly provided for 370-A and B and 452-A and B cars. The use of these earlier heads would necessitate a change of the distributor and the timing marks on the flywheel. The HC ratio of the "C" series head corresponds to the HHC ratio on "A" and "B" series cars and the difference is equally great on LC and HC ratios of these models.

The same gaskets are used on "C" model cars to obtain the various compression ratios with the "C" series heads as with the "HHC" heads used on "B" model cars and on some "A" model cars. In order to use the "C" series head on "A" or "B" series cars, however, it has been necessary to provide thicker gaskets under new part numbers so that the standard "A" and "B" series LC, HC and HHC ratios can be maintained on these cars, regardless of the increased compression of the "C" series heads. It is important that the new (thicker) gaskets, indicated in the table, be used when "C" series heads are used on "A" or "B" series cars so it will not be necessary to change the timing.

At the beginning of production on "A" series cars, separate heads, machined to the required thickness, were used to provide HC and LC ratios. The ratios of these heads cannot be changed to any of the standard ratios by the use of special gaskets. Since a number of these heads are still in use, it is important that the heads be carefully identified before attempting to change the ratio by the use of the special gaskets.

Since any one of several heads have been used interchangeably on "A" and "B" series cars, it may sometimes happen that the heads on the right and left-hand blocks of a car differ and in such cases different gaskets will be required for these heads to maintain the same ratio for both banks of cylinders. It is therefore important that the identity of **both** heads be determined when replacing gaskets. Ordinarily, if the markings on both heads are similar, it may be assumed that both heads are of the same type.

Table of Cylinder Heads and Gaskets

Series Where Used	Cylinder Head Part Number	Identification		Part Number of gasket required to obtain ratios originally specified for various models		
		Marking	Thickness	LC ratio	HC ratio	HHC ratio
370-A and 370-B	1091383†	LC	5 5/32"	889361 (4.9 to 1)	.....*	.....*
	1091440†	HC	5 7/64"	.....*	889361 (5.2 to 1)	.....*
	1091133†	HHC	5 1/16"	894392 (4.9 to 1)	894339 (5.1 to 1)	889361 (5.4 to 1)
	1096172	HHC © or ©	5"	889408 (4.9 to 1)	894392 (5.1 to 1)	894339 (5.4 to 1)
370-C	1096172	HHC © or ©	5"	894392 (5.1 to 1)	894339 (5.4 to 1)	889361 (5.6 to 1)
452-A and 452-B	1090245†	B or LC	5 1/16"	881027 (4.9 to 1)	.....*	.....*
	1090486†	HC	5 1/32"	.....*	881027 (5.1 to 1)	.....*
	1090240†	HHC	4 31/32"	896503 (4.9 to 1)	896450 (5.1 to 1)	881027 (5.4 to 1)
	1096173	HHC © or ©	4 57/64"	883608 (4.9 to 1)	883609 (5.1 to 1)	896450 (5.4 to 1)
452-C	1096173	HHC © or ©	4 57/64"	896503 (5.1 to 1)	896450 (5.4 to 1)	881027 (5.7 to 1)

†No longer furnished for service.

*Not available with cylinder head indicated.

ENGINE—Service Information

In most cases, the cylinder heads are plainly marked so that they may be easily identified, but the safest method is to determine the thickness of the head as measured from the top flange to the surface which rests against the gasket. Both means of identification are given in the table of gaskets presented on page 67A.

When the part number of a cylinder head is definitely established, the proper gasket to use in order to obtain the desired ratio may be determined by referring to the table.

In any case where the "C" series head with the "C" series gasket, part number 889361, is installed on 370-A or B cars, it will be necessary to install V-16 push rods, part number 84244, in place of the original V-12 rods to compensate for the difference in thickness of the heads. This is in addition to the changes in the timing required.

18. Two Types of Pistons Used in 345-C and 355-C Engines

Beginning with engine unit No. 30-990 on 345-C and 355-C engines, the pistons are of a different design than those used prior to this number. The changes in the pistons are in the rings and the lands between the ring grooves as shown in Fig. 1 on this page.

The ring change is in the second groove from the top. This groove is now $\frac{3}{16}$ in. wide and contains two $\frac{3}{32}$ in. compression rings which are effective in preventing blowby and the consequent loss of power.

The two lands between the compression rings and the upper oil ring are chamfered toward the top to aid in keeping down the oil consumption. The top land at the top of the piston is also grooved to prevent as much as possible the dissipation of heat to the rings and the lower part of the piston.

Only these second type pistons are supplied for service in the standard, .015 in. and .030 in. sizes for all "A," "B" and "C" series cars Likewise these pistons will be supplied with all factory reground .015 in. and .030 in. oversize cylinder blocks, not only for these series cars but for the earlier models beginning with the Cadillac 341-A and LaSalle 340.

19. Worn Limits for Cylinder Block

When ordering first or second oversize cylinder blocks from the factory, care should be exercised in determining the amount of wear on the blocks returned for exchange as this wear on the replaced blocks should determine the size of blocks to order.

If the standard size cylinder blocks show less than .012 in. wear or out-of-round they may be returned in exchange for first oversize blocks. If the wear exceeds .012 in. but is less than .027 in., second oversize blocks should be ordered for installation on the car.

20. New Type Chain Housing Oil Seal on 345-C and 355-C Engines

Beginning with engine unit 30-1256 on V-8 cars, a new type oil seal is provided in the chain housing around the water pump drive. This new seal consists of a felt and cork packing in addition to the metal retainers which are retained in this construction. The design of the oil seal is such that it cannot be installed on engines prior to this engine unit number.

21. Adjustment of Valve Spring Pressure on V-12 and V-16 Engines

The relation between valve spring pressure and valve travel on V-12 and V-16 engines is such that each .010 inch of travel is equivalent to 2.73 pounds of pressure. In consequence, the seating pressure of the valves may be reduced considerably by the slight increase in travel occasioned by a valve refacing and reseating operation. Reduced valve seating pressures would, moreover, affect engine performance to a noticeable degree, especially in making cold-weather starting more difficult, and in some cases might cause the valves to burn.

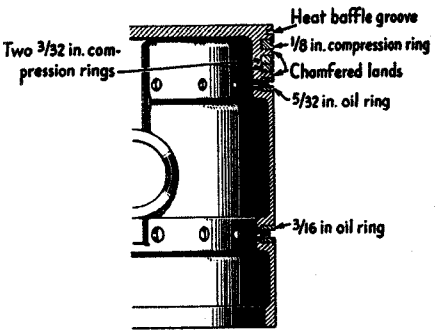


Fig. 1. View showing piston construction and ring arrangement, beginning with engine unit 30-990 on 345-C and 355-C engines.

To control the valve seating pressure it should accordingly be checked after valve refacing operations on V-12 or V-16 engines. Tool, Part No. J-444 should be used for making this test.

The correct seating pressure for the valves on V-12 and V-16 engines, with both valve springs properly installed, is from 48 to 63 pounds. If the pressure is less than 48 pounds, one or more spacers should be installed under the valve spring retainers. A spacer .040 inch thick is available for this purpose, under Part No. 889407. Each spacer will raise the seating pressure 10.9 pounds.

Each valve should be tested separately and one or more spacers installed as required. In case of an extremely low seating pressure, the valve springs should be checked against the specifications given on page 63 to make sure that they have not lost tension and shortened in use.

22. Making Later Changes in Early Vacuum Pumps

Beginning with engine number 2002446 on 345-C cars and engine number 3001589 on 355-C cars, a vacuum pump of slightly different design is used to aid in preventing loss of engine oil. These changes are in the location of the vent hole in the lower pump body, the spring above the diaphragm and in the diaphragm.

The vent hole in the lower pump body is on the right side in the first type pump and on the left side in the second type pump as viewed from the top.

The second type spring above the diaphragm can be identified by the number of coils, the first type springs have twelve coils whereas the second type springs have fifteen coils. The new diaphragm is made of improved material. Only this type diaphragm is carried by the Factory Parts Division.

These changes should be made in any 345 or 355 "B" or "C" series cars before the engine numbers given whenever the diaphragm is found cracked or broken or the pump is contributing to excessive oil consumption.

Although these changes do not apply to the vacuum pump on V-12 and V-16 engines, it is recommended that a new diaphragm, (Part No. 856331) and a lighter spring (Part No. 856358) be installed in cases of diaphragm breakage but under no circumstances should an attempt be made to change the location of the vent hole in V-12 and V-16 vacuum pumps.

ENGINE—Service Information

The necessary parts for making these changes in the V-8 series engines can be secured from the Factory Parts Division under the following part numbers:—1521501—an assembly including the second type diaphragm, spring and a plug for the old vent hole; and 877852, the cork gasket for installation between the flange of the pump body and the crankcase.

These changes can be made in the first type pump as follows:

1. Test vacuum pump for oil leakage by disconnecting the intake manifold pipe at the pump and remove the nipple to which this pipe is connected. If there is any trace of oil in this nipple, these changes should be made.

2. Remove vacuum pump from engine.

3. Disassemble vacuum pump. Be sure to hold upper part of pump while removing the retaining screws to prevent the spring from throwing the diaphragm and upper part of the pump body.

4. Plug the old vent hole in the lower pump body, using the brass ball supplied in the kit. Peen the housing over the ball to hold it in place.

5. Drill a new ¼ in. vent hole 180° or half way around the pump directly opposite the old hole. Be careful to drill this hole straight to avoid its breaking out at the side of the housing.

6. Reassemble pump, using the new parts. First of all, install the various parts in their proper positions and install the retaining screws loosely. Then put the pump in a vise between protecting wooden blocks and tighten the vise until the distance from the lower side of the pump base to the bottom of the plunger shaft for V-8 pumps is 1⅛ in. and 1½ in. on V-12 and V-16 pumps and then tighten the retaining screws securely.

7. Reinstall pump on engine, using new cork gasket whenever oil leakage is noticed at this point.

8. Make a center punch mark for identification in the center of the pump body cover.

EXHAUST SYSTEM

General Description

The arrangement of the exhaust systems on the Cadillac V-8 and the LaSalle cars is the same. The exhaust manifolds are connected at the top to the manifold header to which is connected a single exhaust pipe leading to the muffler.

The exhaust gases pass from the cylinders through the manifolds to the header and out through the exhaust pipe. The flow of hot gases through the header heats the fuel mixture quickly to assist in more thorough vaporization of the fuel.

Two entirely separate exhaust systems are used on both the Cadillac 370-B and 452-B, one system for each block of cylinders. Each of these exhaust systems includes an exhaust manifold, an exhaust pipe, a muffler and a tail pipe.

The 370-B exhaust manifolds are in two sections and the 452-B manifolds are in three sections to allow for expansion. These sections are connected by tight fitting leak-proof sleeves.

The front section of the 370-B exhaust manifolds carries the upper part of the intake header. The center section of the 452-B manifolds contains part of the heat chamber for heating the gases passing from the carburetor to the intake manifold.

All mufflers have an asbestos lining between two shells which are welded together at the ends. The purpose of the asbestos lining is to enable the muffler to stand the extreme heat.

A tuning chamber is built into the 370-B and 452-B mufflers to reduce exhaust noises. This chamber acts on the same principle as the tuning chamber in the carburetor intake silencer.

In addition to the muffler on the 345-B, 355-B cars, a silencing chamber consisting of a piece of pipe about two feet long is mounted above and connected to the tail pipe as shown in Fig. 2, Plate 36. This chamber acts on the same principle as the tuning chamber in the 370-B and 452-B muffler. This tuning chamber is also used on the 452-B tail pipe in addition to the tuning chamber already in the muffler.

The exhaust pipe on the 345-B and 355-B is covered with a heavy asbestos insulation to prevent excessive heat under the hood and in the body.

Rubber cushions are used between the muffler support brackets and the frame on all models to prevent the exhaust vibrations being transmitted to the body.

Service Information

1. Crackling Noises in Manifolds

Some 452-B engines when new, give out a crackling noise after a long run when the ignition is shut off. This noise will be heard only in some new engines and is caused by the contraction of the manifold sections as the exhaust manifolds cool. This condition will not injure the engine and is automatically eliminated after the manifolds and blocks have taken a permanent set.

To correct this condition smooth up the faces and corners of the manifold flanges with emery paper and spread thinly a paste made up of graphite and oil, over the contacting surfaces. Finally pull up the flange nuts tightly but without excessive strain.

2. Installing Exhaust Manifold Gaskets

Exhaust manifolds are subject to such extreme variations in temperature that the metal expands and contracts to a considerable degree. This results in "creeping" on the manifold gaskets which has no undesirable effect unless the bolts are drawn up too tight.

The manifold bolts should be tightened while the engine is running and should be drawn up just enough to stop all exhaust leaks. If the bolts are tightened too securely, the "creeping" of the manifold may rip the copper of the gasket and permit the gasket to burn out.

The possibility of V-12 and V-16 intake and exhaust gaskets blowing out can be greatly reduced by coating them with graphite before installing. Coating the gaskets with graphite makes it easier for the manifold to expand and contract without pulling or wrinkling the gasket which may in some cases cause the gasket to blow out.

EXHAUST SYSTEM

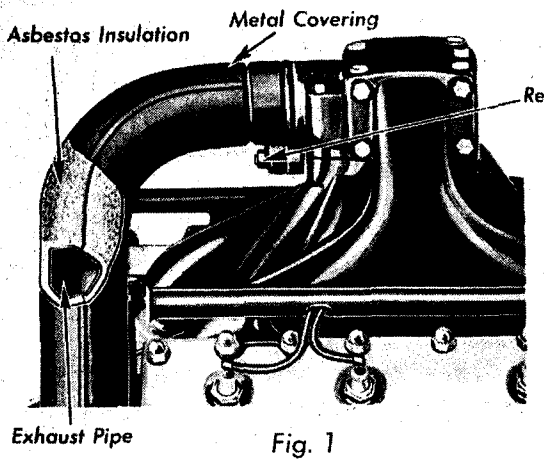


Fig. 1

Metal covering cut away to show asbestos insulation—Cadillac 355-B - La Salle 345-B

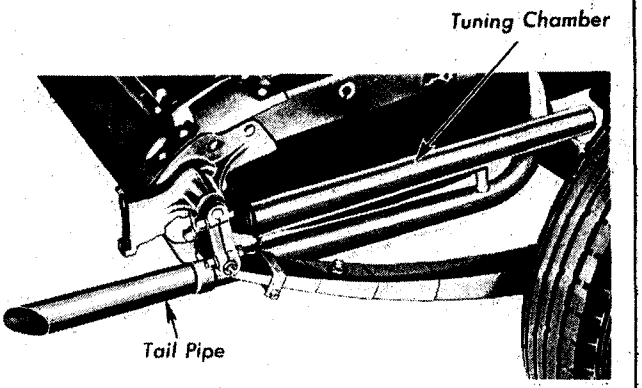


Fig. 2

Tuning Chamber on Tail Pipe—Cadillac 355-B 452-B - La Salle 345-B

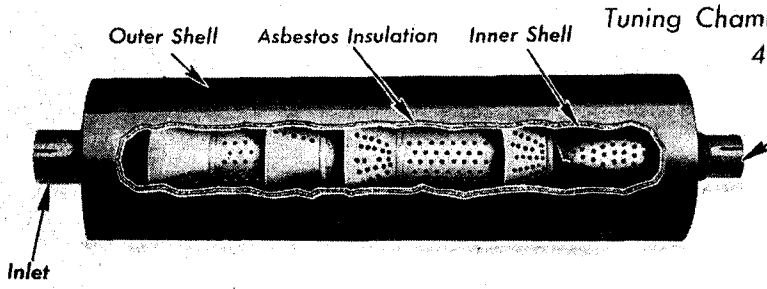


Fig. 3

Cut-away View of Muffler—Cadillac 355-B-La Salle 345-B

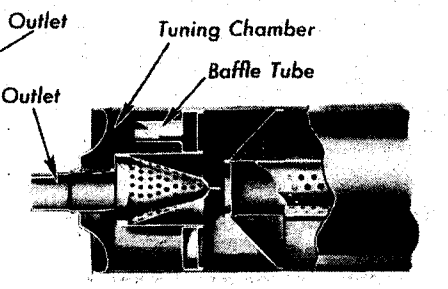


Fig. 4

Sectional View of Muffler Showing Tuning Chamber—Cadillac 370-B, 452-B

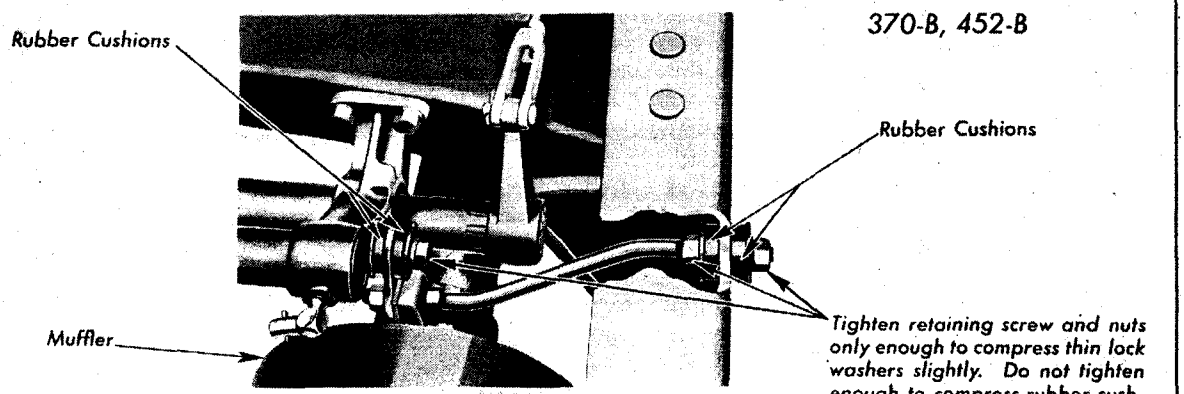


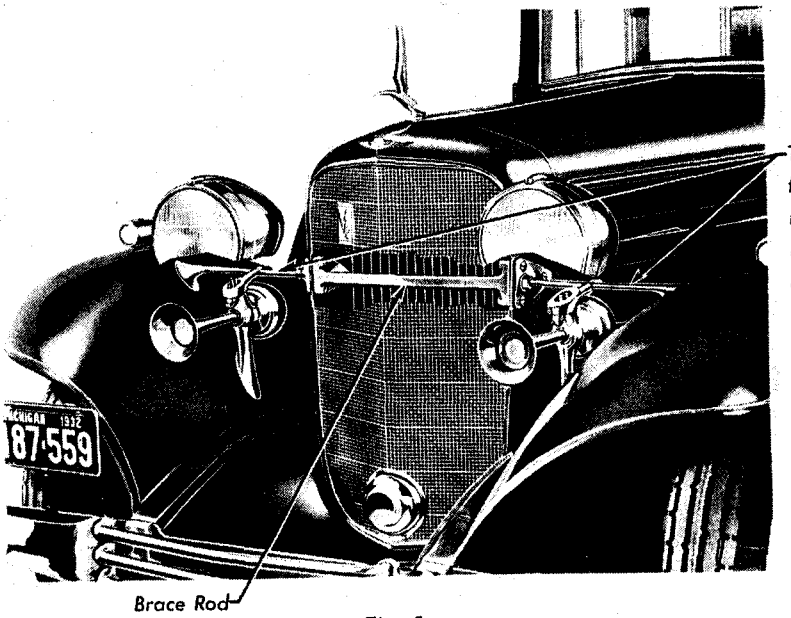
Fig. 5

Front Muffler Support

The rear muffler support is of similar construction and is adjusted in the same manner as the front support.

Plate 36. Exhaust System Details

FENDERS



To remove radiator and casing assembly, first remove fender tie rods by disconnecting them from radiator casing, headlamp brackets and fenders. Brace rod will remain in position in radiator casing

Fig. 1

Radiator grille cut away to show casing brace rod assembly to which the front fender tie rods are attached

To insure proper alignment of fender tie rods when re-installing radiator and casing assembly, attach tie rods to headlamp brackets before fastening them to radiator casing. Adjust tie rods to proper length by turning them in or out of radiator casing bracket

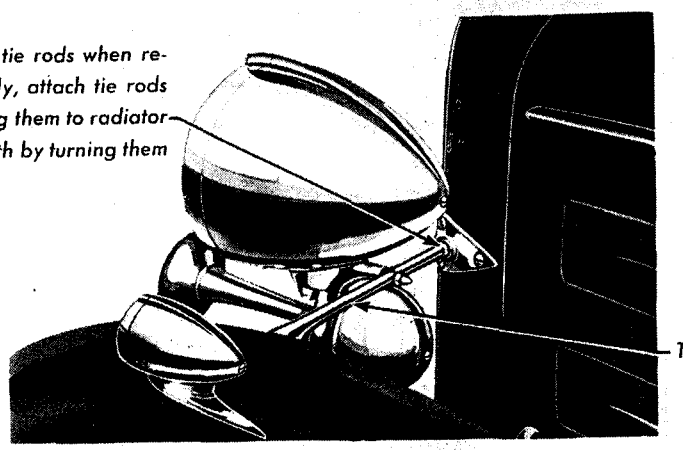
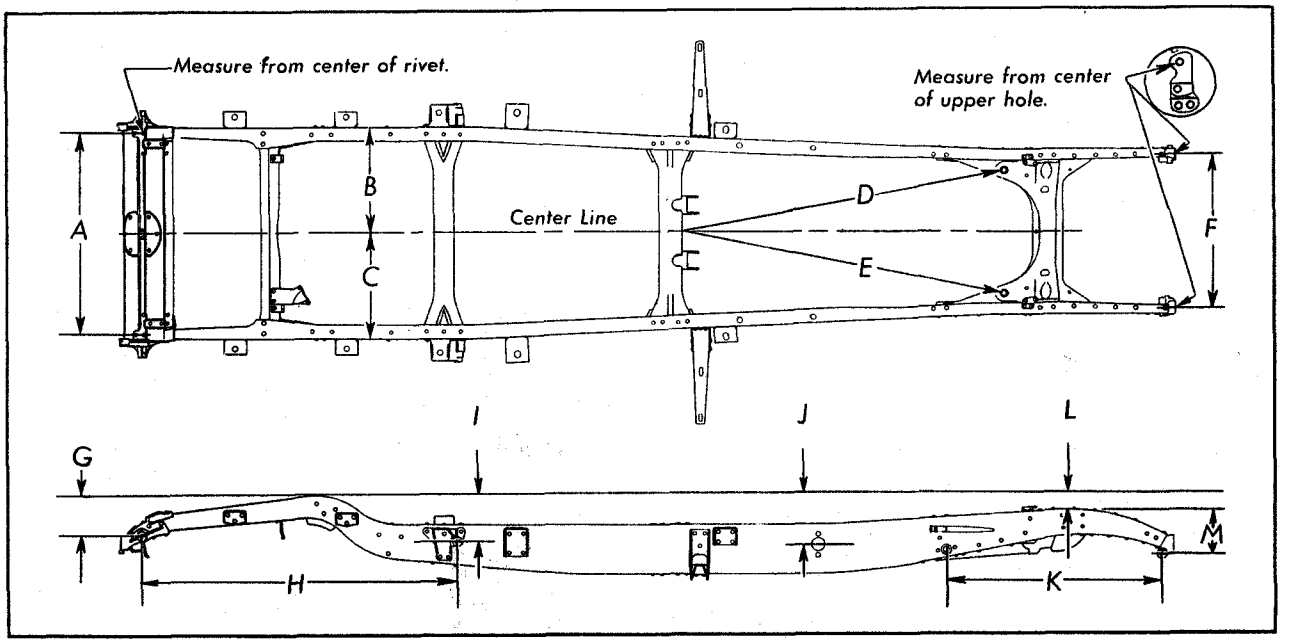


Fig. 2

View showing front fender tie rod

Plate 36A. Front Fender Tie Rods—"C" Series Cars

FRAME



Frame Dimensions

	345-B	355-B (Except 156 in. W.B.)	370-B (Except 156 in. W.B.)	355-B, 370-B (156 in. W.B.)	452-B
A	36¼"	36¼"	36¼"	36¼"	36¼"
B-C	"B" should equal "C" at any point along frame				
D-E	"D" should equal "E"				
F	27⅜"	27⅜"	27⅜"	27⅜"	27⅜"
G	7⅛"	7⅛"	7⅛"	7⅛"	7⅛"
H	56¼"	56¼"	56¼"	58¼"	58¼"
I	8¼"	8¼"	8¼"	8¼"	8¼"
J	9 1/64"	9" 1/64	9 1/64"	9⅛"	9⅛"
K	38 5/32"	38 5/32"	38 5/32"	41⅛"	41⅛"
L	2 11/16"	2 11/16"	2 11/16"	2 11/16"	2 11/16"
M	7 29/32"	7 29/32"	7 29/32"	7 29/32"	7 29/32"

Plate 37. Frame Alignment

FRAME

General Description

Cadillac and LaSalle frames are of the double drop type. They are of the same construction on all models, differing only in dimensions. Unusually deep side bars and box-type cross-members add materially to the rigidity of the frame, particularly at the front end.

The front cross-member is heavily reinforced to stiffen the frame against flexing and extends back far enough to support the front end of the engine. The side bars are 9 in. deep on the 345-B, 355-B and 370-B and 10 in. deep on the 452-B. Box type sections reinforce the side bars between the front outriggers and the front cross members.

The two center cross-members are also of a box-shaped section. The first of these two cross-members supports the rear end of the engine through the transmission ball-joint socket. At the rear end of the frame are two pressed steel cross-members.

The running board brackets are of heavy channel section. Only one bracket is used for each running board as the rear ends are supported by the rear fenders.

Specifications

Subject and Remarks	LaSalle	Cadillac		
	345-B	355-B	370-B	452-B
Car				
Chassis model designation	345-B	355-B	370-B	452-B
Chassis unit number location	.....	.....	.....	.....
All models—rear of L. H. side of radiator cross member.				
First serial number	1,100,001	1,200,001	1,300,001	1,400,001
Length of car—overall (approximately)				
5 Wheels—				
130 in. W. B.	204⅛"	.....	.....	.....
134 in. W. B.	.....	207⅛"	207⅛"	.....
136 in. W. B.	210⅛"	.....	.....	.....
140 in. W. B.	.....	213⅛"	213⅛"	.....
143 in. W. B.	.....	.....	.....	216⅛"
149 in. W. B.	.....	.....	.....	222⅛"
6 Wheels—				
130 in. W. B.	209⅛"	.....	.....	.....
134 in. W. B.	.....	212⅛"	212⅛"	.....
136 in. W. B.	215⅛"	.....	.....	.....
140 in. W. B.	.....	218⅛"	218⅛"	.....
143 in. W. B.	.....	.....	.....	221⅛"
149 in. W. B.	.....	.....	.....	227⅛"
Wheelbase (nominal)	130", 136"	134", 140"	134", 140"	143", 149"
Width of car overall (approximately)	76⅛"	76¼"	76¼"	76¼"
Frame				
Chassis (unit) number location	.....	.....	.....	.....
345-B, 355-B and 370-B,—L. H. side radiator cross member near frame side bar.				
452-B—L. H. side radiator cross member near frame side bar.				
Number of cross members	5	5	5	5
Side bar—				
Depth	9"	9"	9"	10"
Thickness	$\frac{5}{32}$"	$\frac{5}{32}$"	$\frac{5}{32}$"	$\frac{5}{32}$"
Width—top and bottom	2½"	2½"	2½"	2½"
Measurements taken at deepest part of frame.				
Width of frame at—				
Front	29½"	29½"	29½"	29½"
Rear	38"	38"	38"	38"

GASOLINE SYSTEM

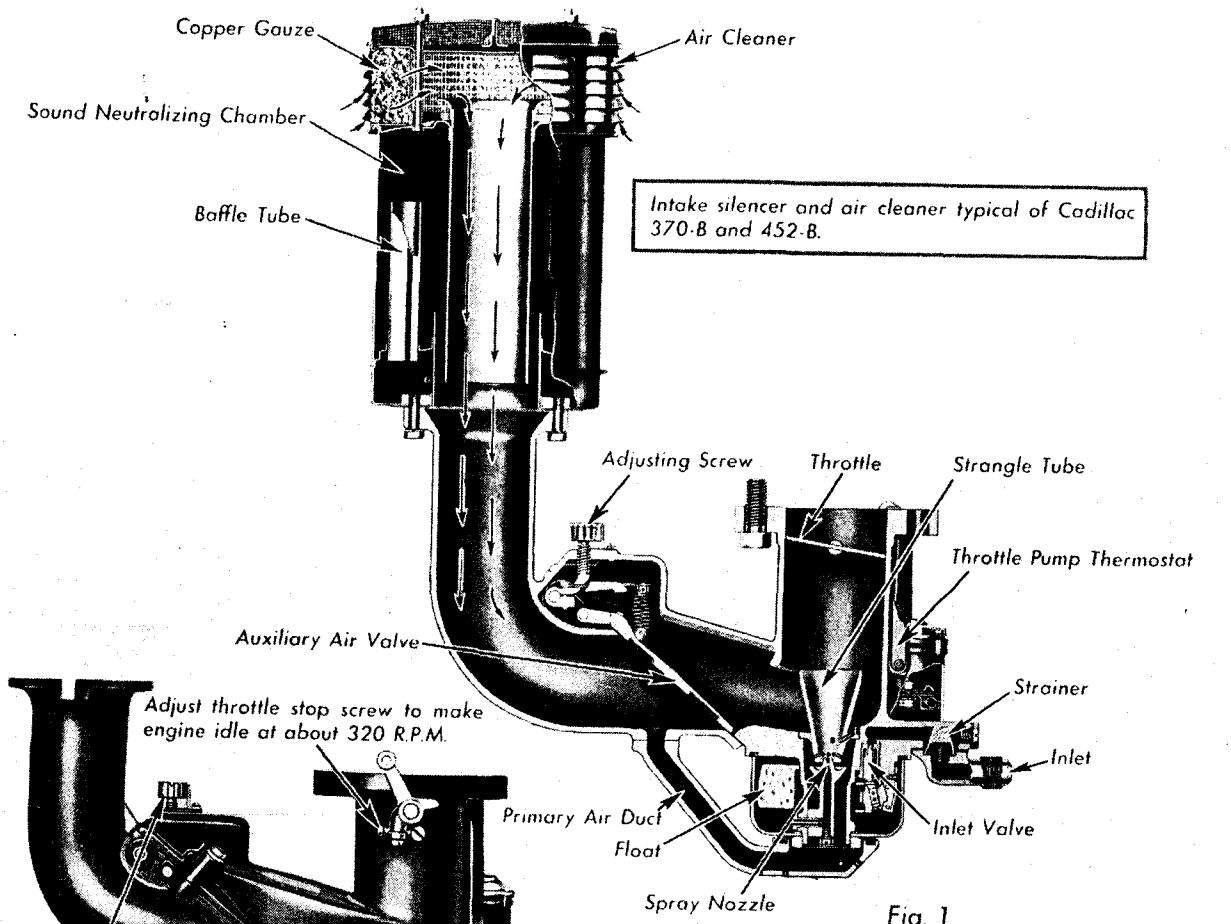


Fig. 1
Sectional View of Carburetor, Intake Silencer and Air Cleaner

Fig. 2
Carburetor Adjustments

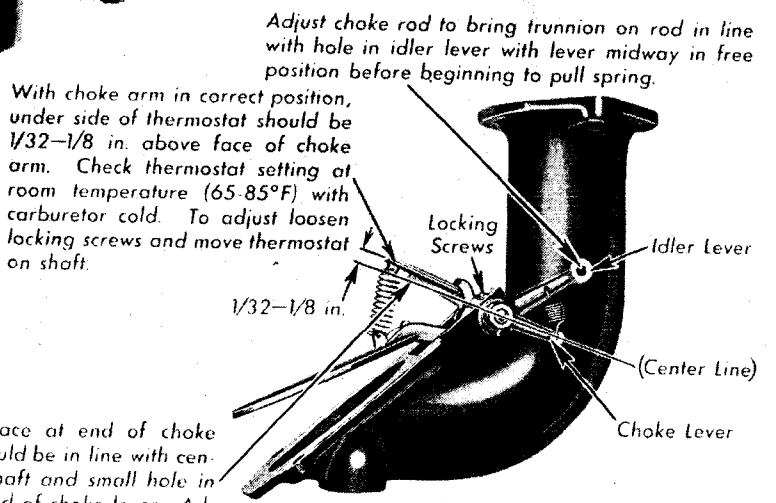


Fig. 3
Choke and Auxiliary Air Thermostat Adjustments

Plate 38. Carburetor Details and Adjustment and Intake Muffler—Cadillac 355-B—LaSalle 345-B

GASOLINE SYSTEM

General Description

The general arrangement of the gasoline system is the same on all cars. The 370-B and 452-B system differs slightly however, as each of these cars has two carburetors.

The gasoline line from the rear supply tank is mounted outside of the frame where the air sweeping by tends to cool the gasoline and thereby prevent the possibility of vapor lock. Sharp bends and low spots in the fuel line have also been eliminated by running the line as nearly straight as possible from the tank to the fuel pump.

CARBURETOR

The 345-B and 355-B carburetors are of the same general construction typical of those used on previous car models and the method of adjusting is the same on both models.

The 370-B and 452-B carburetors are of the expanding air valve type. They are simple in construction with no thermostats and have only one adjustment, which controls the mixture by varying the flow of fuel rather than the air.

The carburetors used on the 370-B and 452-B are identical with the exception of the size of the metering pin. A No. 10 metering pin is used in the 370-B carburetors and a No. 12 in the 452-B carburetors. Otherwise the carburetors on these car models are fully interchangeable. Right and left carburetors differ in the control levers. The name plate marking identifies the type of carburetor; 370-B carburetors are Type R-13 and L-13; 452-B carburetors are Type R-14 and L-14. The carburetor consists chiefly of two units, namely, the main metering unit and the auxiliary unit.

The *main metering unit* consists of a pair of air valves or vanes, hinged at their lower ends and opening upwards to admit air to the mixing chamber. These vanes have fingers which engage a central aspirating tube, raising it as the vanes open. This aspirating tube is attached to a spring loaded hollow stem and piston working in a dashpot, the piston carrying the fuel metering orifice in its lower end. An adjustable tapered metering pin projects into this orifice.

The *auxiliary unit* combines an auxiliary power jet, an accelerating pump, and a priming passage for starting. The operation of the auxiliary unit is controlled by the registering of ports in the starting sleeve, which line up with passages in the throttle body. The starting sleeve rotates with the starting lever (choke lever) and the pump plunger and piston move downward as the throttle is opened.

OPERATION

For *normal running* the fuel enters the carburetor float bowl through the strainer and float needle valve, and is maintained at constant level by the float and float needle valve. This level of fuel should be $\frac{13}{16}$ to $\frac{15}{16}$ in. below top of float bowl casting.

Air enters the carburetor through the air inlet and lifts the vanes as it passes upwards into the mixing chamber. The weight of these vanes combined with the pressure exerted by the dashpot spring causes a partial vacuum to exist in the mixing chamber, which draws fuel from the aspirating tube. The quantity of the fuel flowing is controlled by the tapered metering pin; at idle speed the vanes are almost closed and the metering pin almost fills the orifice in the air valve piston. As the vanes rise to admit more air, the aspirating tube also rises and the metering orifice becomes larger due to the taper on the metering pin. This combination maintains the correct ratio of fuel and air for average running.

For *maximum power* at any speed a richer mixture is required than is necessary for part throttle running. The power jet supplies the required extra fuel while the throttle is held open beyond the point which would give a road speed of about 60 miles per hour. At this throttle position the pump plunger has travelled downward and has shut off the air vent to the power jet, therefore, the suction on the discharge nozzle draws fuel from the pump cylinder up through the hollow stem of the pump plunger and through the power jet into the mixing chamber. At part throttle positions below 60 miles per hour road speed this power jet does not supply fuel since it is vented to the outside air through the air vent hole in the upper part of the starting sleeve.

The quantity of fuel drawn from the power jet is controlled by the air bleed hole in the pump plunger stem.

For *rapid acceleration* it is necessary to supply a momentarily rich mixture. This extra fuel is supplied by means of the accelerating pump.

A rapid opening of the throttle causes a rapid downward movement of the pump plunger and piston, forcing fuel up through the hollow stem of the pump plunger and out through the discharge

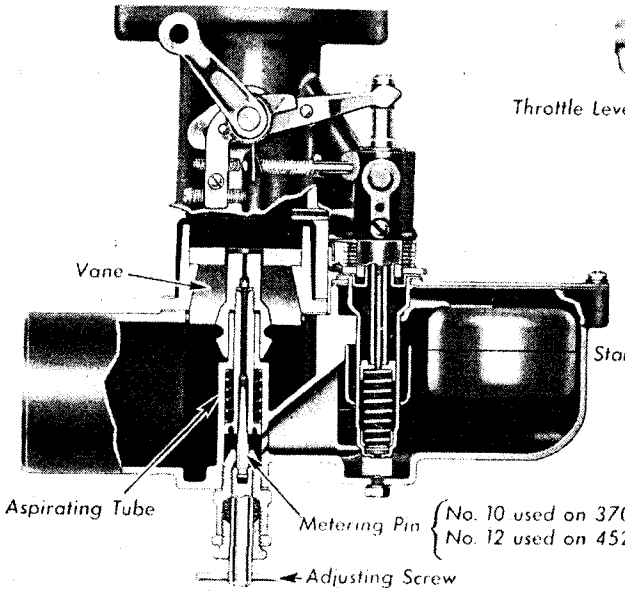


Fig. 1
Sectional View of Carburetor

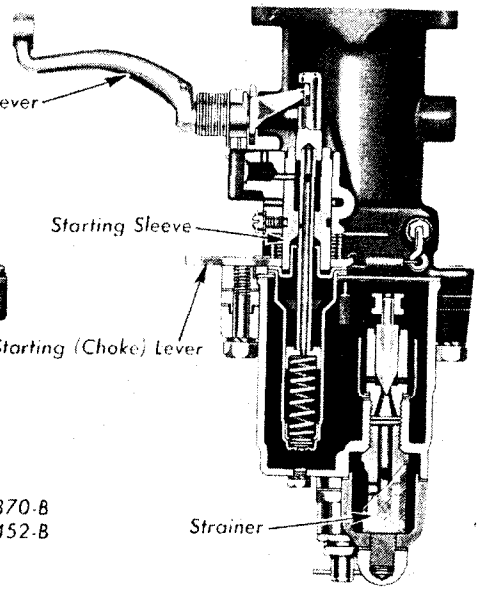


Fig. 2
Cross-section of Carburetor

Note: Adjustment for engine idling speed should precede carburetor adjustments. Adjust throttle stop screws to make engine idle at about 320 R.P.M.

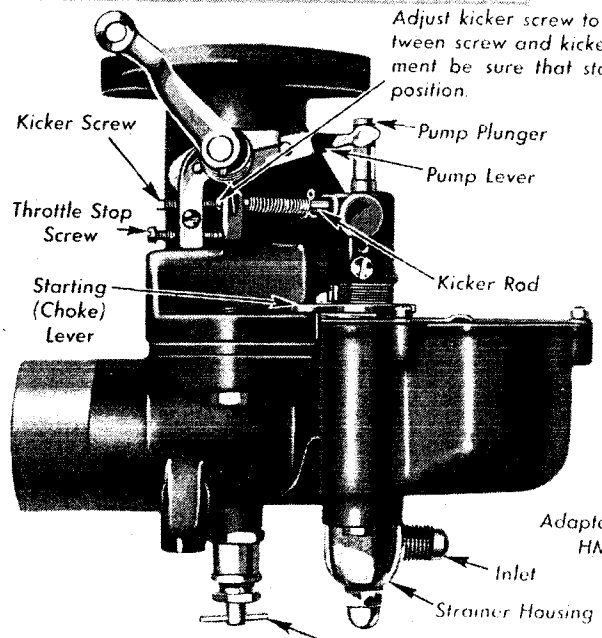


Fig. 3
Carburetor Adjustments

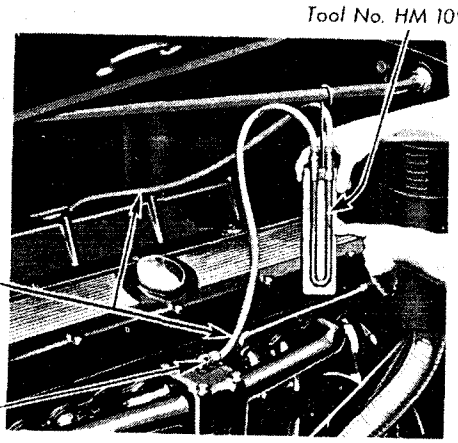


Fig. 4
Gauge for equalizing carburetor adjustments

Plate 39. Carburetor Details and Adjustment—Cadillac 370-B and 452-B

nozzle into the mixing chamber. The fuel in the pump cylinder cannot escape back into the float chamber because of the check valve in the bottom of the pump cylinder.

In general—for steady driving conditions up to 60 miles per hour on level roads the fuel is all supplied from the aspirating tube. When the throttle is opened suddenly an additional charge of fuel is supplied from the accelerating pump, and if the throttle is held open as for hard pulling or high speed, extra fuel continues to flow from the pump discharge nozzle through the power jet.

FUEL PUMP

The fuel feed on all models is by a fuel pump. This pump is operated by a push (driving) rod riding against a cam on the distributor shaft and is located at the front of the engine on the left, in the coolest position under the hood.

The principal moving element of the fuel pump is a diaphragm actuated through a series of levers and rods as shown in Fig. 2, Plate 40. The operation is as follows. When the push rod is moved in and out by the action of the driving cam, it in turn operates the rocker arm which is pivoted at the lower end. The rocker arm pulls the pull rod and diaphragm assembly down, creating a vacuum in the pump chamber which draws gasoline from the rear tank into the sediment bowl and through the strainer and inlet valve into the pump chamber.

The diaphragm is moved upward on the return stroke by pressure of the diaphragm spring. On this stroke the gasoline is forced from the pump chamber through the outlet valve, into the vapor dome and thence to the carburetor.

When the carburetor bowl is filled and the inlet needle valve closes, a back pressure is created in the fuel pump chamber. This pressure holds the diaphragm down against the pressure of the diaphragm spring, and keeps it in this position until more fuel is needed in the carburetor and the needle valve opens.

The rocker arm is in two pieces, operating as a single part when the diaphragm is working up and down. However, when fuel is not required and the link or lower part of the operating lever is held down at one end by the diaphragm pull rod, the lever or upper part operates in the usual way. This is made possible by the fact that the lever operates against the link only in the downward direction, the upward movement of both parts being accomplished by spring pressure. A second spring is provided for keeping the lever in contact with the driving rod at all times.

INTAKE SILENCER

An intake silencer is used on all models. The silencer silences the roar of the intake at certain engine speeds under open throttle. There are no moving parts or baffle plates on these silencers and they require no attention in service.

A feature of the air silencer is the copper gauge air cleaner which is designed to catch any dust or lint in the air before it is drawn into the carburetor. It is automatic in operation and requires no attention other than periodic cleaning.

Service Information

1. Gasoline Gauge Adjustment

If the gasoline gauge does not register correctly and the variation from accuracy is the same over the entire scale, a readjustment of the float on the tank unit should correct the trouble. The float adjusting screw at the side of the float rod gear is accessible, if the tank unit of the gauge system is removed from the tank.

Accurate readings between 0 and 4 gals. should not be expected.

2. Equalizing Carburetor Adjustments—370-B, 452-B

The adjustments of the two carburetors on the 370-B and 452-B cars should be equalized to secure smooth running of the engine. The best method to follow is to use an equalizing gauge as shown in Fig. 4, Plate 39. The gauge is connected to the intake manifolds after both the brake assister and vacuum lines are disconnected. The throttle rod must also be disconnected from the right-hand carburetor.

A preliminary adjustment of the metering pins and throttle on both carburetors is then made to bring the idling speed at approximately 320 R. P. M.

To determine whether or not the engine is running at the correct idling speed, remove the oil filler cap from one of the valve covers and hold a finger on one of the valve rocker arms so that the movements of the rocker arm may be counted. At 320 R. P. M. the valve will open forty times in fifteen seconds.

Make sure that the gauge hangs straight and check the level of the mercury in the tube. When the metering pins and throttle stop screws are properly adjusted, both columns of mercury should be at the same height and the engine should run smoothly at 320 R. P. M.

If the columns of mercury are not at the same level and the engine speed is too fast, reduce the speed by backing off the throttle stop screw on the side on which the mercury column is the lower. If the speed is too slow, turn the throttle stop screw in a little on the side on which the mercury column is higher.

If the mercury columns are at the same level and the engine speed is too fast or too slow, adjust both throttle stop screws, turning them exactly the same amount to secure the correct idling speed, at the same time keeping the mercury columns at the same level.

Re-check the metering pin adjustments and idling speed on both carburetors, making sure that the mercury columns are maintained at the same level.

Adjust the right-hand throttle control rod to exactly the right length so that the clevis pin can be slipped into place without changing the engine speed.

A further check should be made on the throttle adjustment by running the engine at approximately 1000 R. P. M. and noting the mercury level in the gauge. If the columns are not practically level, a slight readjustment of the right-hand

GASOLINE SYSTEM

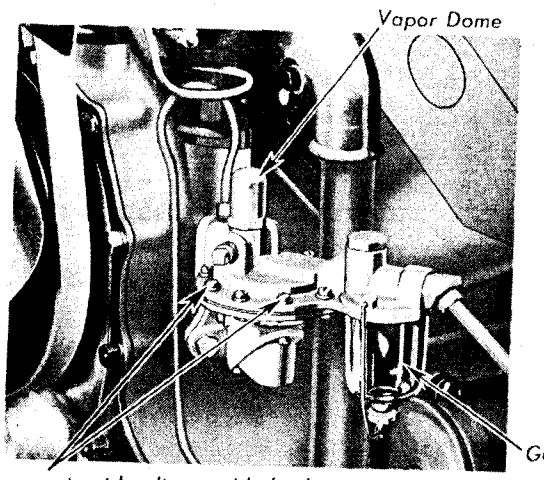


Fig. 1
Fuel Pump

Pump housing must not be disassembled unless necessary special tools for reassembly are available.

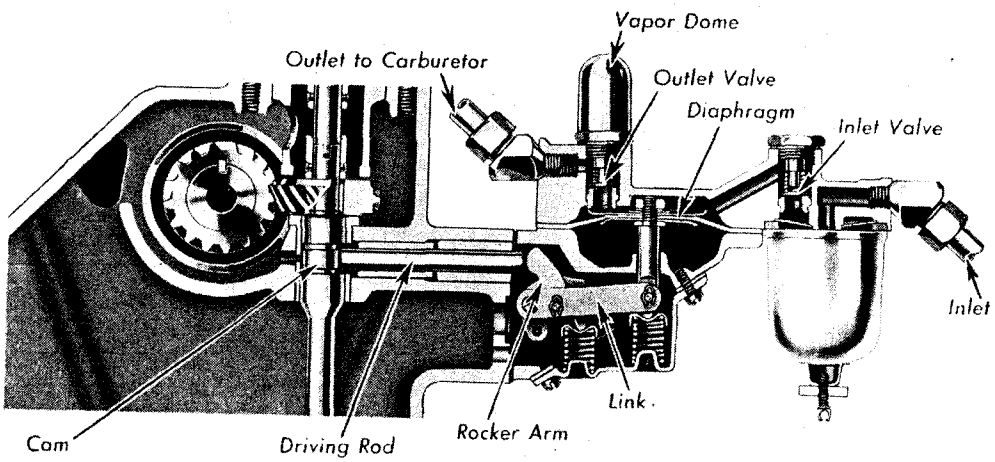
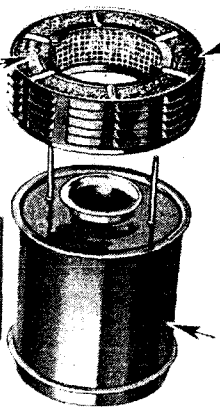


Fig. 2
Sectional View of Fuel Pump and Drive

To clean cover simply wipe off with cloth before installing on gauze unit.



Clean gauze unit by washing in gasoline to remove all dirt from gauze and dry with an air hose. Then dip in light engine oil and allow to drain before reinstalling on silencer. Install gauze unit on silencer with louvers pointing down.

Note:
Do not wash intake silencer or cover containing fabric pad.

For normal driving in cities and on hard surfaced roads, clean air cleaner once every 6,000 miles. Under extreme conditions, such as continuous driving on dusty roads or in localities where there is considerable dust in the air, cleaning may be required as frequently as every 2,000 miles.

Fig. 3
Exploded view of Air Cleaner

Plate 40. Fuel Pump and Carburetor Air Cleaner

throttle control rod will be necessary. Finally run the engine again at idling speed and check the mercury columns again. A very slight readjustment of the throttle control rods may be necessary to bring them to the proper level again.

If an equalizing gauge is not available, the following method may be used to equalize the carburetor adjustment.

Disconnect the coil wire for the right-hand cylinder block. Adjust the metering pin of the left-hand carburetor in the same manner as when using mercury tube and set the throttle stop screw so the engine will just turn over without stalling.

Then disconnect the coil wire for the left-hand cylinder block and adjust the metering pin and the stop screw on the right-hand carburetor in a similar manner.

With the metering pins and throttle stop screws on both carburetors properly adjusted, the engine should idle at about 320 R. P. M.

Inasmuch as some air is drawn into the manifold of the carburetor being adjusted through the vacuum brake assister connection on the opposite intake manifold, the foregoing adjustment will probably be slightly rich when all cylinders are operating. To correct this, it may be necessary to screw up slightly each metering pin adjustment. This can best be checked by listening to exhaust and making final adjustment with both sides firing.

When a satisfactory adjustment of both carburetors has been secured, adjust the length of the right-hand throttle control rod very carefully, so that the pin will slip into place without affecting the throttle opening on either carburetor. This adjustment must be made very accurately so as not to disturb the throttle equalization. While testing the car on the road, the above adjustments should be rechecked to be sure they are satisfactory.

3. Servicing the Fuel Pump.

The service operations which can be performed on the fuel pump without special tools are the cleaning of the filter and the replacement of the filter parts, the vapor dome, and the inlet and outlet valves. Under no circumstances should the pump housing be disassembled unless the necessary special tools for reassembly are available.

Service on the fuel pump can be obtained from A. C. service stations, which have special tools and spare parts.

Distributors and larger Dealers are advised to keep a pump on hand for exchange to render prompt service. Distributors who wish to make all pump repairs themselves can secure the necessary tools from any A. C. service station.

Specifications

Subject and Remarks	LaSalle	Cadillac		
	345-B	355-B	370-B	452-B
Air cleaner and intake silencer, make of	A.C.	A.C.	A.C.	A.C.
Feed	.....	.....	.....	.....
All models—A.C. fuel pump.				
Gasoline line location	.....	.....	.....	.....
All models—outside of left frame side bar.				
Gasoline gauge (electric) make of (See Note 1)	A.C.	A.C.	A.C.	A.C.
Tank capacity (supply)	30 gal.	30 gal.	30 gal.	30 gal.
Carburetor				
Adjustments, equalizing (See Note 2)	.....	.....	.....	.....
Float setting	$\frac{7}{16}$"	$\frac{7}{16}$"	.....	.....
Size	2"	2"	1½"	1½"
Size of metering pin	.....	.....	10	12
Size of nozzle (Nozzle No.)	19	19	.....	.....
Thermostats—				
Air valve free movement with choke on	None	None	.....	.....
Throttle pump control operates	110-115°	110-115°	.....	.....
Throttle shaft end play				
New limit, not over	.0015"	.0015"	.0015"	.0015"
Worn limit, not over	.005"	.005"	.005"	.005"
Type	Air valve	Air valve	Expanding air valve	Expanding air valve
Unit number location	.....	.....	.....	.....
345-B, 355-B—Top front flange at R. H. side				
370-B, 452-B—Top side of top flange under gasket				
Fuel pump service (See Note 3)	.....	.....	.....	.....

LIGHTING SYSTEM

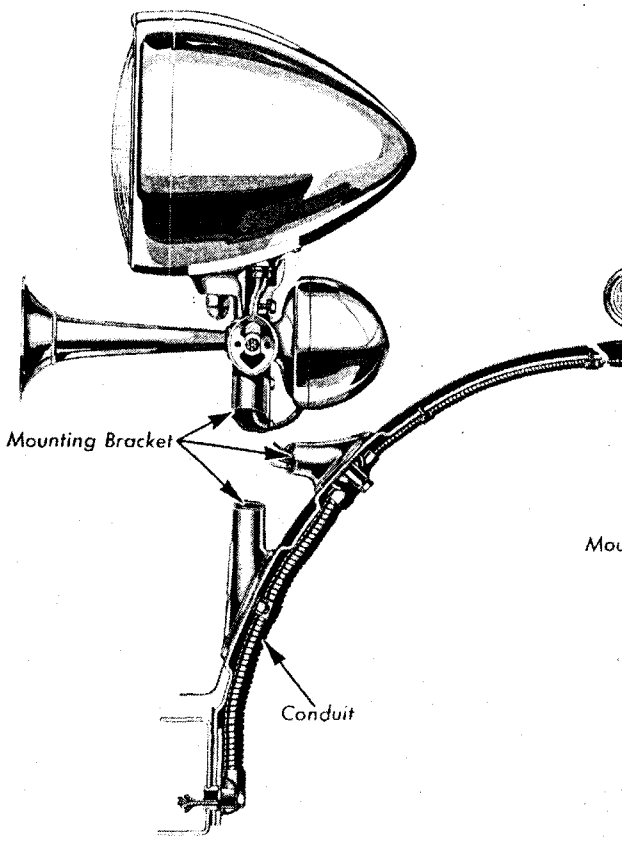


Fig. 1
Headlamp Mounting—
Cadillac 355-B, 370-B and 452-B

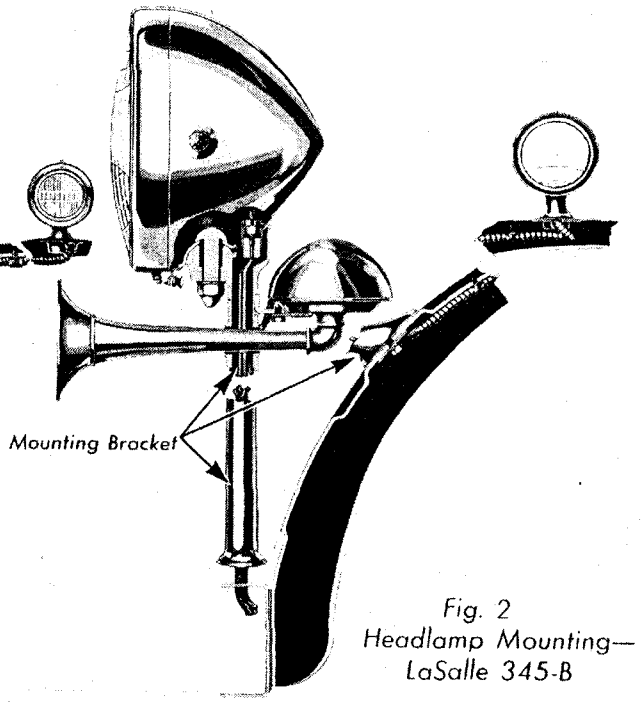


Fig. 2
Headlamp Mounting—
LaSalle 345-B

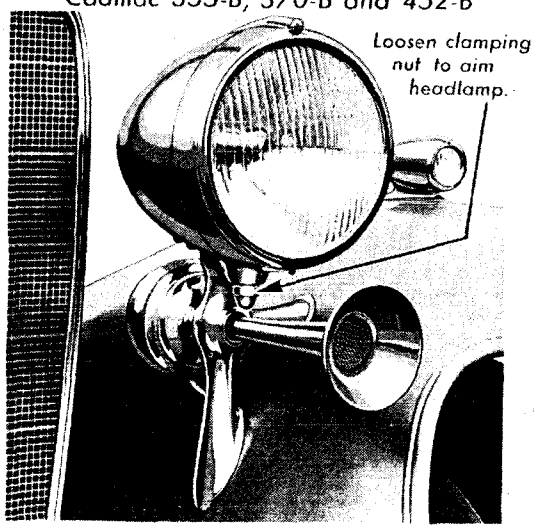


Fig. 3

To aim headlamp, first set lamp so that flutes on lens are straight up and down. Then turn lamp sidewise or up and down to give light beam shown in Figs. 3 or 7, Plate 42. Hold lamp in this position and tighten nut securely, after which test lamp again to make sure it is properly aimed. Cover one lamp while working on other one.

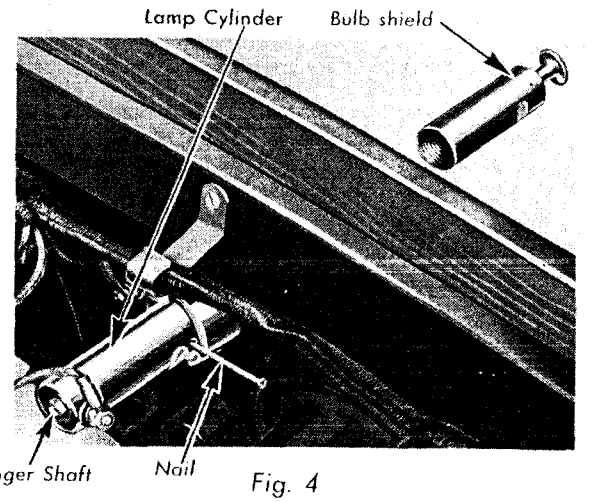


Fig. 4
Removing bulb shield for gaining access to bulb

To remove the map lamp bulb the bulb shield must first be removed as follows: Pull lamp out part way to bring end of threaded shaft on plunger flush with rear edge of lamp cylinder. Then turn bulb shield slowly until hole in plunger comes opposite one in cylinder. Next insert nail or its equivalent in hole to keep plunger from turning and remove bulb shield by unscrewing it from cylinder. The bulb shield has a right-hand thread.

Plate 41. Lamp Details

LIGHTING SYSTEM

General Description

SUPER-SAFE headlighting is used on all Cadillac models. The LaSalle lighting system is of the conventional type used on previous Cadillac and LaSalle cars. The LaSalle headlamps are of the fixed focus type and are alike, using fluted lenses and 32-32 candle-power double filament bulbs.

The SUPER-SAFE lighting system is used exclusively by Cadillac and actually comprises two independent lighting systems, one for the right-hand and one for the left-hand lamp. The lamps are purposely made so that the doors, lenses or reflectors cannot be interchanged. The same type of bulb, however, is used in both lamps.

The basis of the SUPER-SAFE lighting system is the bulb (Mazda 3001) with three filaments, one 32 candle-power and two 21 candle-power. The bulbs are placed in position in the two headlamps so that the 32 candle-power filament is uppermost in the left-hand lamp and at the bottom in the right-hand lamp. The slots in the sockets are so arranged that it is impossible to insert the bulbs in the wrong position.

The headlamps are wired so as to give four combinations of lighting, namely: City Passing, City Driving, Country Passing and Country Driving.

For *City Passing*, both headlamps give a depressed beam illuminating the right side of the road. This beam does not glare but it gives adequate illumination.

When in the *City Driving* position, both headlamps give a non-glaring beam of sufficient illumination for dark streets. This beam complies with all city regulations.

In the *Country Passing* position, the left headlamp with two filaments lighted, gives intense illumination of the right side of the road close in front of the car. This illuminates clearly any ditches or obstacles, while the right headlamp gives a moderate tilted non-glaring beam straight ahead.

For *Country Driving*, the left headlamp gives normal illumination, moderately tilted while the right headlamp, with two filaments lighted illuminates the road far ahead. This combination of light gives more and better placed illumination than is possible with conventional type headlamps, even when 32 candle-power bulbs are used.

The standard "Country Driving" beam projected by SUPER-SAFE headlamps is designed to add to the safety of night driving by directing a moderate amount of light above the headlamp level.

The elevated beam shows the way uphill and around turns, and illuminates road signs and other objects which have most of their light reflecting surface above the road level.

This added light has been ruled to be illegal in the states listed below. Cadillac cars shipped into these states have the "Country Driving" beam (upper beam) modified to eliminate this stray light. On cars for California, Oregon and Washington, the No. 9 terminal on the lighting switch is eliminated to prevent the use of the 32 candle-power beam in the right headlamp. The standard lighting switch must not be used in these three states.

The beam modification for the remaining states consists in rendering the 32 candle-power beam in the right headlamp inoperative by the use of a special switch lever at the top of the steering wheel. Owners of cars thus modified should be cautioned against any attempt to restore to use the filament thus eliminated.

Drivers from other states who are in a position to enjoy the added safety feature at home should refrain from using the "Country Driving" position when visiting the states listed below in which the added light is illegal.

Massachusetts	New York	Washington
Virginia	Connecticut	Oregon
Maryland	Rhode Island	Minnesota
Pennsylvania	New Hampshire	Vermont
New Jersey	Maine	Ontario, Can.
Iowa	California	

The headlamps are supported by brackets mounted on the front fenders. The wiring connections at the headlamps are made through a male and female plug inside the headlamp supports. Three wires enter the right headlamps and two enter the left headlamp. The wire tips have different length shanks to indicate their respective positions in the plug. The plugs are also indexed into the retainers which in turn are indexed into the lamp sockets. Thus, the connections must be properly made before the various parts will fit into their respective places.

LIGHTING SYSTEM

Replace bulb if it shows signs of blackening. Try lighting switch in all positions to see that all filaments burn properly.

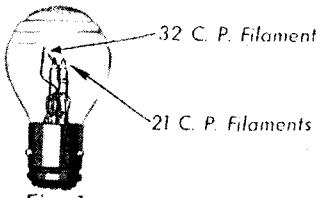
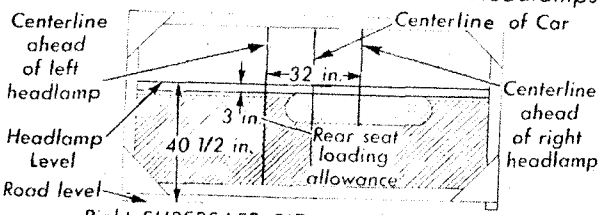
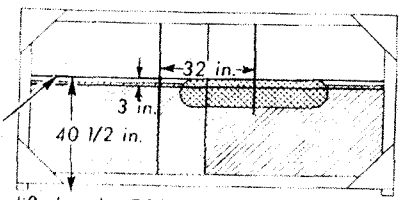


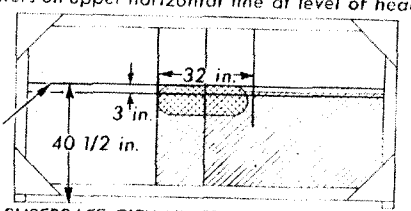
Fig. 1
Three-filament Bulb for SUPERSAFE Headlamps



Right SUPERSAFE CITY UPPER BEAM correctly aimed for unloaded car.
Aim right headlamp so that light beam centers on right vertical line on screen directly ahead of lamp so that upper edge of beam registers on lower horizontal line.



Modified right COUNTRY UPPER BEAM correctly aimed for loaded car in states which do not permit the use of the standard Country Upper Beam.
Aim right headlamp so that light beam centers on right vertical line on screen directly ahead of lamp so that upper edge of beam registers on upper horizontal line at level of headlamp center.



Left SUPERSAFE CITY UPPER BEAM correctly aimed for unloaded car.
Aim left headlamp so that left side of light beam coincides with left vertical line and upper edge of beam is on upper horizontal line.

Fig. 3

Aiming practices vary in different states so that no single set of instructions is applicable. The aiming practice described above is the one advocated by the Cadillac Motor Car Company as likely to result in maximum safety and comfort to all concerned. Where some other practice is specified by law or regulation, follow it.

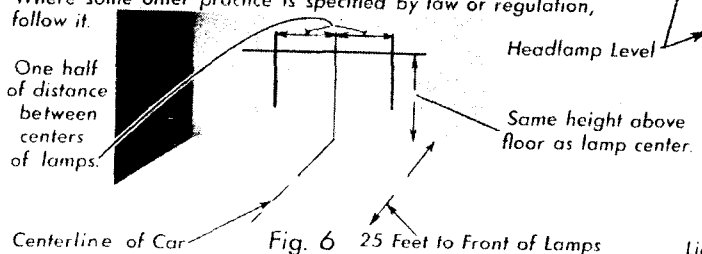


Fig. 6
Markings for Adjustment at LaSalle Headlamps

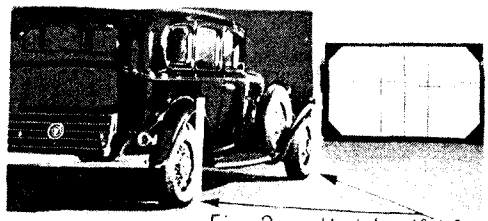


Fig. 2 Uprights 40-1/2 in. long

Adjustment set-up showing proper position of car with reference to screen and accurate method of locating level of headlamp centers on screen. Locate car on a reasonably level surface with headlamps aimed toward and twenty-five feet from screen. Draw a horizontal line on screen at level of headlamp centers, located by sighting over two uprights, 40-1/2 inches long, placed opposite the wheels as shown above. This is extremely important. Draw a second line 3 inches below the first. Locate center point on lines by sighting through center of rear window and over center of radiator cap. Draw vertical lines 16 inches to either side of this center point, directly ahead of each lamp.

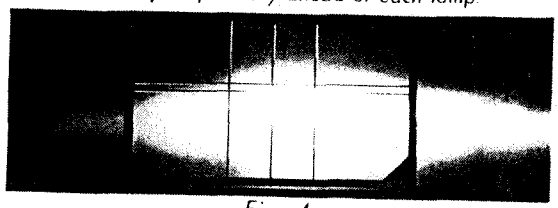


Fig. 4
Composite CITY UPPER BEAM pattern on properly marked adjustment screen

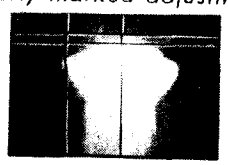


Fig. 5
SUPERSAFE CITY UPPER BEAM with lens removed

Fixed-focus headlamps need no focusing but better results will be obtained if the switch is turned to the "City Upper Beam" position and several bulbs are tried until one is obtained which produces a beam pattern like that shown above with the hot spot as bright and as near the top of the beam as possible.

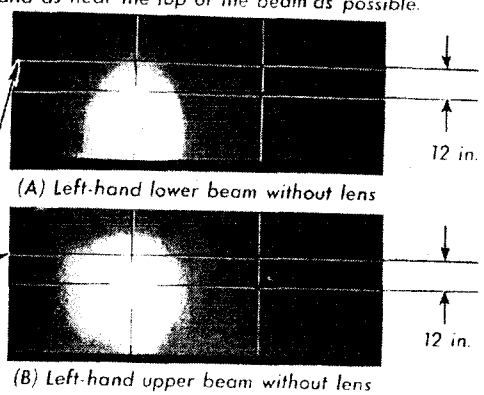


Fig. 7
LaSalle 345-B Light Beams

Light beams with lamp properly aimed. After adjusting one lamp, repeat adjustment on other lamp.

Plate 42. Super-Safe Lamp Bulb and Focusing Charts

The rear lamps on all cars are combination tail and stop lamps. Each lamp has two bulbs, one 3-candle-power for the tail light, and one 15-candle-power, which serves for both the stop and back-up lights. The larger bulb is lighted by the switch on the brake pedal bracket for the stop light, and by a new switch on the transmission for backing.

The rear lamp is fitted with a special ruby lens with a reflex area around the outer edge for reflecting the light of an approaching car when the rear lights are out. Incorporated in the center of this ruby lens is a special blue lens directly in line with the 15-candle-power bulb. This blue lens is illegal in California and cars shipped into this state are provided with a small ruby lens instead of the blue lens.

The blending of the blue light with the ruby produces a brilliant hue which attracts immediate attention. The lower half of the blue portion of the lens is thinner in section than the upper half, providing ample illumination for backing.

Service Information

1. Stop and Back-up Lamp Connections.

The feed wire for the stop and back-up lamp is connected to the ignition switch and the circuits are protected by a fuse in the apparatus box.

These lamp circuits are connected to the ignition switch to prevent excessive load on the battery in case the car is parked in reverse or the stop light remains on after the brake pedal is depressed by application of the hand brake lever.

When checking the stop and back-up lamp circuit for shorts or burned out bulbs, make sure that the ignition switch is turned on.

2. Cleaning Headlamp Reflectors

Great care should be exercised in polishing the headlamp reflectors to preserve the reflecting qualities. A good cleaning paste can be made by mixing rouge or talcum powder with alcohol. Dry lamp black and alcohol are just as satisfactory and may be more convenient. Apply the paste with a clean soft cloth and rub from the center outward in straight lines. Never polish reflectors with a circular motion because the fine circular lines break up the light rays and appreciably reduce the illumination.

3. Headlamp Misalignment Frequently Caused by Pushing Car

Misalignment of headlamps is oftentimes caused by workmen pushing against the headlamps when moving the car. The headlamps should never be used for this purpose.

Specifications

Subject and Remarks	LaSalle	Cadillac		
	345-B	355-B	370-B	452-B
Bulb Data				
Voltage—all bulbs	6-8	6-8	6-8	6-8
Back-up and stop lamp— (See Note 1)				
Candle power	15	15	15	15
Contact	Single	Single	Single	Single
Mazda No.	87	87	87	87
Dome (closed cars)—				
Candle power	6	6	6	6
Contact	Single	Single	Single	Single
Mazda No.	81	81	81	81
Fender lamp—				
Candle power	3	3	3	3
Contact	Single	Single	Single	Single
Mazda No.	63	63	63	63
Headlamp—				
Candle power	32-32	21-21-32	21-21-32	21-21-32
Contact	Double	Triple	Triple	Triple
Mazda No.	1000	3001	3001	3001
Instrument (dash) lamps—				
Candle power	3	3	3	3
Contact	Single	Single	Single	Single
Mazda No.	63	63	63	63

LIGHTING SYSTEM—Specifications

Subject and Remarks	LaSalle	Cadillac		
	345-B	355-B	370-B	452-B
Bulb Data—Cont'd				
Map reading lamp—				
Candle power	3	3	3	3
Contact	Single	Single	Single	Single
Mazda No.	63	63	63	63
Rear quarter lamp—				
Candle power	6	6	6	6
Contact	Single	Single	Single	Single
Mazda No.	81	81	81	81
Tail lamp—				
Candle power	3	3	3	3
Contact	Single	Single	Single	Single
Mazda No.	63	63	63	63
Headlamps				
Cleaning reflectors (See Note 2)	.....	.....	.....	.....
Misalignment (See Note 3)	.....	.....	.....	.....
Lens diameter	10½"	8 11/16"	8 11/16"	8 11/16"
Overall diameter	11"	9½"	9½"	9½"
Switches				
Delco-Remy type number—				
Back-up	440-E	440-E	440-E	440-E
Lighting	486-H	486-S	486-S	486-S
Stop light	474-R	474-R	474-R	474-R
Stoplight switch adjustment	.....	.....	.....	.....
Switch in "ON" position with brake pedal depressed ¾ to 1 in.				

LUBRICATION

Service Information

1. Extreme Pressure Lubricants for Rear Axle and Transmission

There are on the market gear lubricants known as extreme pressure lubricants which are designated by the letters "E. P." following their S. A. E. classification.

These lubricants have been developed for the lubrication of gears. Some of these lubricants should not be used in units that have bronze parts, as they produce an etching action on bronze and will cause it to corrode under severe conditions. Other "E. P." lubricants, however, have been developed that are satisfactory from the standpoint of corrosion

As all Cadillac and LaSalle cars have bronze parts in the transmission and later cars have bronze thrust washers in the differential, extreme pressure lubricants should not be used unless approved by the Cadillac Motor Car Co.

2. Thinning Gear Lubricant with Kerosine

Gear lubricant for the transmission and differential need be thinned only at the beginning of cold weather if a sufficient quantity of kerosine is added to take care of the lowest expected temperature. The lubricant for the steering gear should not be thinned.

3. 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—Replace lubricant in rear axle and transmission, except 452-C transmission, with lighter lubricants or thin the summer lubricant with kerosine.

The engine oil should be drained and replaced with lighter oil as specified or thinned with the proper amount of kerosine.

Flush radiator and add anti-freeze solution in proportions recommended in the Operator's Manual.

At beginning of warm weather—Drain light or thinned lubricant and replace with fresh lubricant of the proper viscosity for summer driving.

Every 6000 miles—Check level of special oil in shock absorbers.

Every 6000 miles—Remove plug at bottom of oil filter on Cadillac V-12 and V-16 cars and drain out sludge. This can be done on the car by shielding exhaust pipe.

Every 12000 miles—Replace oil filter cartridge on Cadillac V-8 and LaSalle. Remove and clean engine oil pan and screen at same time.

Specifications

Subject and Remarks	LaSalle	Cadillac		
	345-B	355-B	370-B	452-B
Engine—				
Capacity	8 qts.	8 qts.	9 qts.	10 qts.
Lubricant recommended (S. A. E. viscosity)				
Summer	40-50	40-50	40-50	40-50
Winter	20	20	20	20
Extreme Pressure Lubricants (See Note 1)				
Fan	.....	.....	.....	.....
345-B, 355-B—Overflow from pressure regulator.				
370-B, 452-B—Gun lubricated with chassis grease.				
Kerosine, thinning gear lubricant with (See Note 2)	.....	.....	.....	.....
Rear Axle—				
Capacity in pints	6	6	6	6
Lubricant recommended (S. A. E. viscosity)	200 at 210° F.	200 at 210° F.	200 at 210° F.	200 at 210° F.
Fill to level of overflow opening.				
Special items (See Note 3)	.....	.....	.....	.....
Transmission—				
Capacity in pints	4½	4½	4½	4½
Fill to level of overflow obening.				
Lubricant recommended (S. A. E. Viscosity)	200 at 210° F.	200 at 210° F.	200 at 210° F.	200 at 210° F.

Lubricants

	Cadillac No.	Gen. Motors No.
Chassis lubricant (Grease for Alemite fittings)	G-11	4612-M
Engine oil	See recommendations, Page 85	
Transmission and rear axle lubricant—		
Summer (except 452-C transmission)	A-200	4510-M
Winter (except 452-C transmission)	A-110	4519-M
452-C transmission (all year)	A-0200	4593-M
Steering gear lubricant	A-0200	4593-M
Water pump grease	G-13	4614-M
Wheel and clutch release bearing lubricant	G-12	4613-M

LUBRICATION

LUBRICATION SCHEDULE

CADILLAC V-8 355-B

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 SPEEDS.			LUBRICANT	LUBRICATION NO. AND MILEAGE AT WHICH DUE											
				1	2	3	4	5	6	7	8	9	10	11	12
				1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
LUBRICATION NOS. 1, 5, 7 AND 11		ADD LIQUID TO RADIATOR	WATER OR ANTI-FREEZE	O	O	O	O	O	O	O	O	O	O	O	O
		ADD ENGINE OIL AS NECESSARY	ENGINE OIL	O		O		O		O		O		O	
		STARTER, GENERATOR AND DISTRIBUTOR OIL CUPS	ENGINE OIL	O	O	O	O	O	O	O	O	O	O	O	O
		BRAKE AND RIDE REGULATOR PINS AND CONNECTIONS	ENGINE OIL	O	O	O	O	O	O	O	O	O	O	O	O
		ACCELERATOR, ROCKER SHAFT	ENGINE OIL	O	O	O	O	O	O	O	O	O	O	O	O
		DOOR HARDWARE	ENGINE OIL	O	O	O	O	O	O	O	O	O	O	O	O
		GREASE GUN CONNECTIONS	CHASSIS LUBRICANT	O	O	O	O	O	O	O	O	O	O	O	O
		WATER PUMP GREASE CUP	WATER PUMP LUBRICANT	O	O	O	O	O	O	O	O	O	O	O	O
		CLUTCH RELEASE FORK	WHEEL BEARING LUBRICANT	O	O	O	O	O	O	O	O	O	O	O	O
		*ADD WATER TO STORAGE BATTERY	DISTILLED WATER	O	O	O	O	O	O	O	O	O	O	O	O
		CHECK TIRE INFLATION		O	O	O	O	O	O	O	O	O	O	O	O
	LUBRICATION NOS. 2, 4, 8 AND 10	DRAIN AND REPLACE ENGINE OIL	ENGINE OIL		O		O		O		O		O		O
		CLUTCH RELEASE BEARING	WHEEL BEARING LUBRICANT		O		O		O		O		O		O
	LUBRICATION NOS. 3 AND 9	TRANSMISSION—ADD LUBRICANT	TRANSMISSION LUBRICANT			O			O			O			O
		REAR AXLE—ADD LUBRICANT	REAR AXLE LUBRICANT			O			O			O			O
		STEERING GEAR—ADD LUBRICANT	STEERING GEAR LUBRICANT			O			O			O			O
LUBRICATION NOS. 6 AND 12		FREE-WHEELING CONTROL VALVE AND CYLINDER	LIGHT MACHINE OIL						O						O
		FRONT BRAKE LEVERS	CHASSIS LUBRICANT						O						O
		SPRING COVERS	GEAR LUBRICANT						O						O
		WHEEL BEARINGS	WHEEL BEARING LUBRICANT						O						O
		SPEEDOMETER DRIVE SHAFT	CHASSIS LUBRICANT						O						O
		**REFILL SHOCK ABSORBERS	SPECIAL OIL						O						O
		**FLUSH COOLING SYSTEM							O						O
		**REPLACE OIL FILTER CARTRIDGE, CLEAN OIL PAN AND SCREEN						EVERY 12,000 MILES							O

*IN SUMMER INSPECT BATTERY EVERY 500 MILES OR AT LEAST EVERY 2 WEEKS.
**RECOMMENDED BUT NOT INCLUDED IN LUBRICATIONS 6 AND 12.
THE FOLLOWING OPERATIONS CANNOT BE PLACED ON A MILEAGE BASIS AND ARE NOT INCLUDED IN THE ABOVE SCHEDULE:
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.

RECORD ON OTHER SIDE

Plate 43. Lubrication Schedule and Record Card—Cadillac 355-B. Typical of LaSalle 345-B

LUBRICATION—Engine Oil Recommendations

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	Colder than 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. kerosine to 7 qts. oil	S. A. E. viscosity 10 thinned with 1 qt. kerosine to 7 qts. oil or S. A. E. viscosity 20 thinned with 2 qts. kerosine to 6 qts. oil
Prolonged High Speed Driving	These oils are *not* suitable for prolonged high speed driving. Change to oil shown below before starting on long trip at speeds above 45 m. p. h. **Cadillac Approved "Heavy Duty" Oils—Summer and Winter** These are oils having an S. A. E. viscosity of 40-50-60 which are required to meet certain specifications in order to demonstrate their fitness for prolonged high speed driving. NOTE: Approved lubricants vary in their suitability for winter use. If an oil with a high cold viscosity or pour test is used in winter and the car is not kept in a heated garage ,add from one to two quarts of kerosine 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 kerosine to the fresh oil, unless starting immediately on a long trip at high speeds.			

IMPORTANT

The Lubrication Charts presented on pages 86 and 88 for the "B" series cars, can be made applicable to the corresponding "C" series cars by making the following changes·

Cadillac 355-C and LaSalle 345-C

Clutch Control (Controlled Free-wheeling) not used.

Brake Assister—Remove plug in cylinder head and inject 1 ounce of S. A. E. No. 10 oil or light machine oil of weight similar to shock absorber oil every 6000 miles.

Shock Absorber Links—No lubrication necessary on LaSalle 345-C cars.

Front Brake Lever—Alemite fitting provided—Apply chassis lubricant at connection with grease gun every 1000 miles.

Special Item—Clean curled hair in brake assister air cleaner by washing with high test gasoline. For normal driving in cities and on hard surfaced roads clean air cleaner once each year. Under extreme conditions, such as continuous driving on dusty roads or in localities where there is considerable dust in the air, cleaning may be required two or more times a year.

Cadillac 370-C and 452-C

Clutch Control (Controlled Free-wheeling) not used.

Brake Assister—For cars ("A," "B" and "C" series) provided with ratchet type grease cup: Fill grease cup with light cup grease (Cadillac No. G-2½—General Motors No. 4534-M) and turn down a few turns every 1000 miles.

Brake Assister—For cars ("A," "B" and "C" series) provided with wick oiler: Fill oiler reservoir with S. A. E. No. 20 engine oil every 6000 miles.

Front Brake Lever—Alemite fitting provided: Apply chassis lubricant at connection with grease gun every 1000 miles.

LUBRICATION

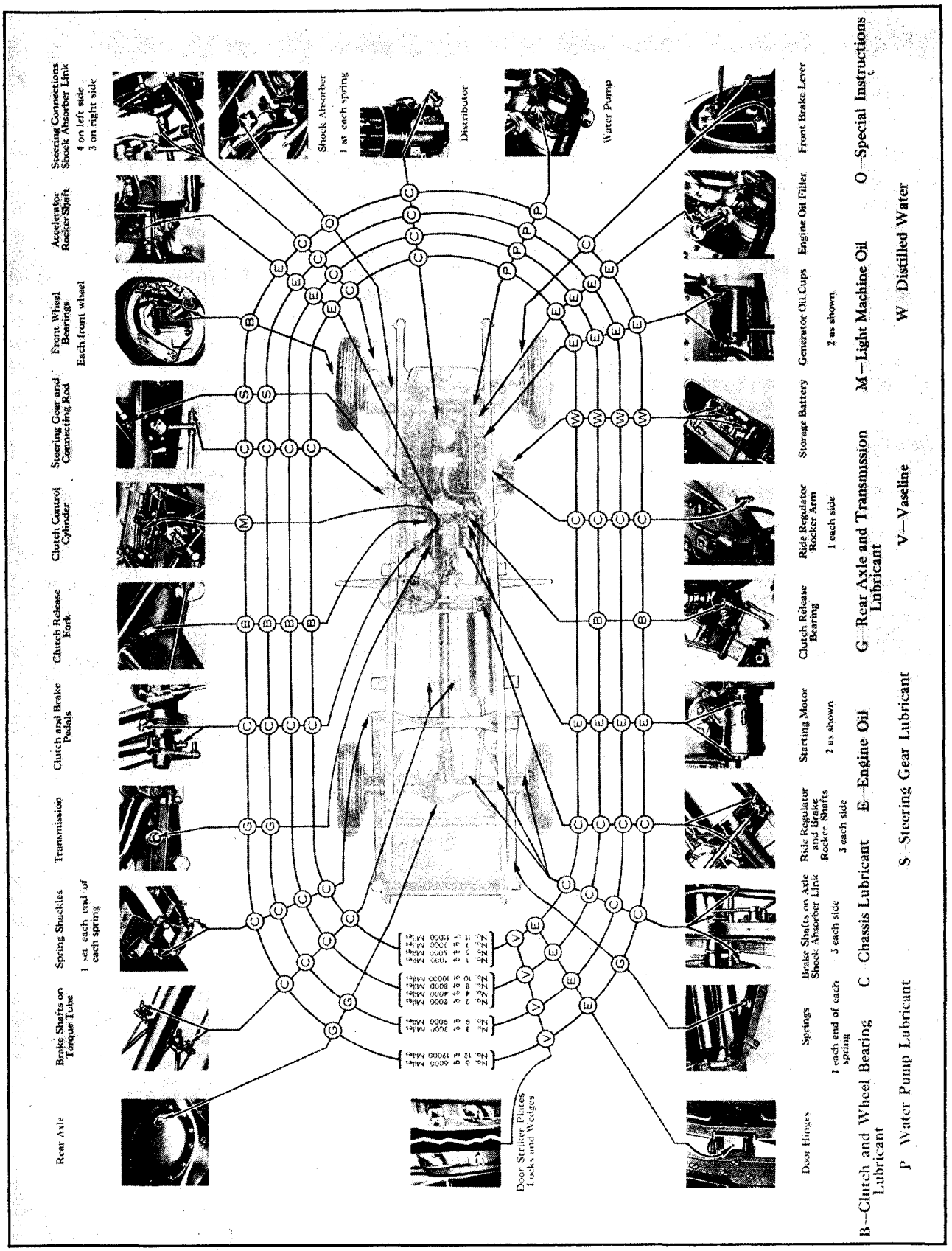


Plate 44. Lubrication Chart—Cadillac 355-B. Typical of LaSalle 345-B

LUBRICATION

LUBRICATION SCHEDULE

CADILLAC 370-B

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 SPEEDS.

		LUBRICANT	LUBRICATION NO. AND MILEAGE AT WHICH DUE											
			1	2	3	4	5	6	7	8	9	10	11	12
			1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
LUBRICATION NOS. 1, 5, 7 AND 11	ADD LIQUID TO RADIATOR	WATER OR ANTI-FREEZE	O	O	O	O	O	O	O	O	O	O	O	O
	ADD ENGINE OIL AS NECESSARY	ENGINE OIL	O		O		O		O		O		O	
	STARTER, GENERATOR AND DISTRIBUTOR OIL CUPS	ENGINE OIL	O	O	O	O	O	O	O	O	O	O	O	O
	BRAKE AND RIDE REGULATOR PINS AND CONNECTIONS	ENGINE OIL	O	O	O	O	O	O	O	O	O	O	O	O
	ACCELERATOR AND CHOKE ROCKER SHAFT	ENGINE OIL	O	O	O	O	O	O	O	O	O	O	O	O
	DOOR HARDWARE	ENGINE OIL	O	O	O	O	O	O	O	O	O	O	O	O
	GREASE GUN CONNECTIONS	CHASSIS LUBRICANT	O	O	O	O	O	O	O	O	O	O	O	O
	WATER PUMP GREASE CUP	WATER PUMP LUBRICANT	O	O	O	O	O	O	O	O	O	O	O	O
	CLUTCH RELEASE FORK AND BRAKE ASSISTER	WHEEL BEARING LUBRICANT	O	O	O	O	O	O	O	O	O	O	O	O
	*ADD WATER TO STORAGE BATTERY	DISTILLED WATER	O	O	O	O	O	O	O	O	O	O	O	O
	CHECK TIRE INFLATION		O	O	O	O	O	O	O	O	O	O	O	O
LUBRICATION NOS. 2, 4, 8 AND 10	DRAIN AND REPLACE ENGINE OIL	ENGINE OIL		O		O		O		O		O		O
	CLUTCH RELEASE BEARING	WHEEL BEARING LUBRICANT		O		O		O		O		O		O
LUBRICATION NOS. 3 AND 9	TRANSMISSION—ADD LUBRICANT	TRANSMISSION LUBRICANT			O			O			O			O
	REAR AXLE—ADD LUBRICANT	REAR AXLE LUBRICANT			O			O			O			O
	STEERING GEAR—ADD LUBRICANT	STEERING GEAR LUBRICANT			O			O			O			O
LUBRICATION NOS. 6 AND 12	FREE-WHEELING CONTROL VALVE AND CYLINDER	LIGHT MACHINE OIL						O						O
	FRONT BRAKE LEVERS	CHASSIS LUBRICANT						O						O
	SPRING COVERS	GEAR LUBRICANT						O						O
	WHEEL BEARINGS	WHEEL BEARING LUBRICANT						O						O
	SPEEDOMETER DRIVE SHAFT	CHASSIS LUBRICANT						O						O
	FAN	CHASSIS LUBRICANT						O						O
	DRAIN OIL FILTER AND FLUSH COOLING SYSTEM							O						O
	**REFILL SHOCK ABSORBERS	SPECIAL OIL						O						O
	**CLEAN OIL PAN AND SCREEN						EVERY 12,000 MILES							O

*IN SUMMER INSPECT BATTERY EVERY 500 MILES OR AT LEAST EVERY 2 WEEKS.
**RECOMMENDED BUT NOT INCLUDED IN LUBRICATIONS 6 AND 12.
THE FOLLOWING OPERATIONS CANNOT BE PLACED ON A MILEAGE BASIS AND ARE NOT INCLUDED IN THE ABOVE SCHEDULE:
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.

RECORD ON OTHER SIDE

Plate 45. Lubrication Schedule and Record Card—Cadillac 370-B. Typical of 452-B

LUBRICATION

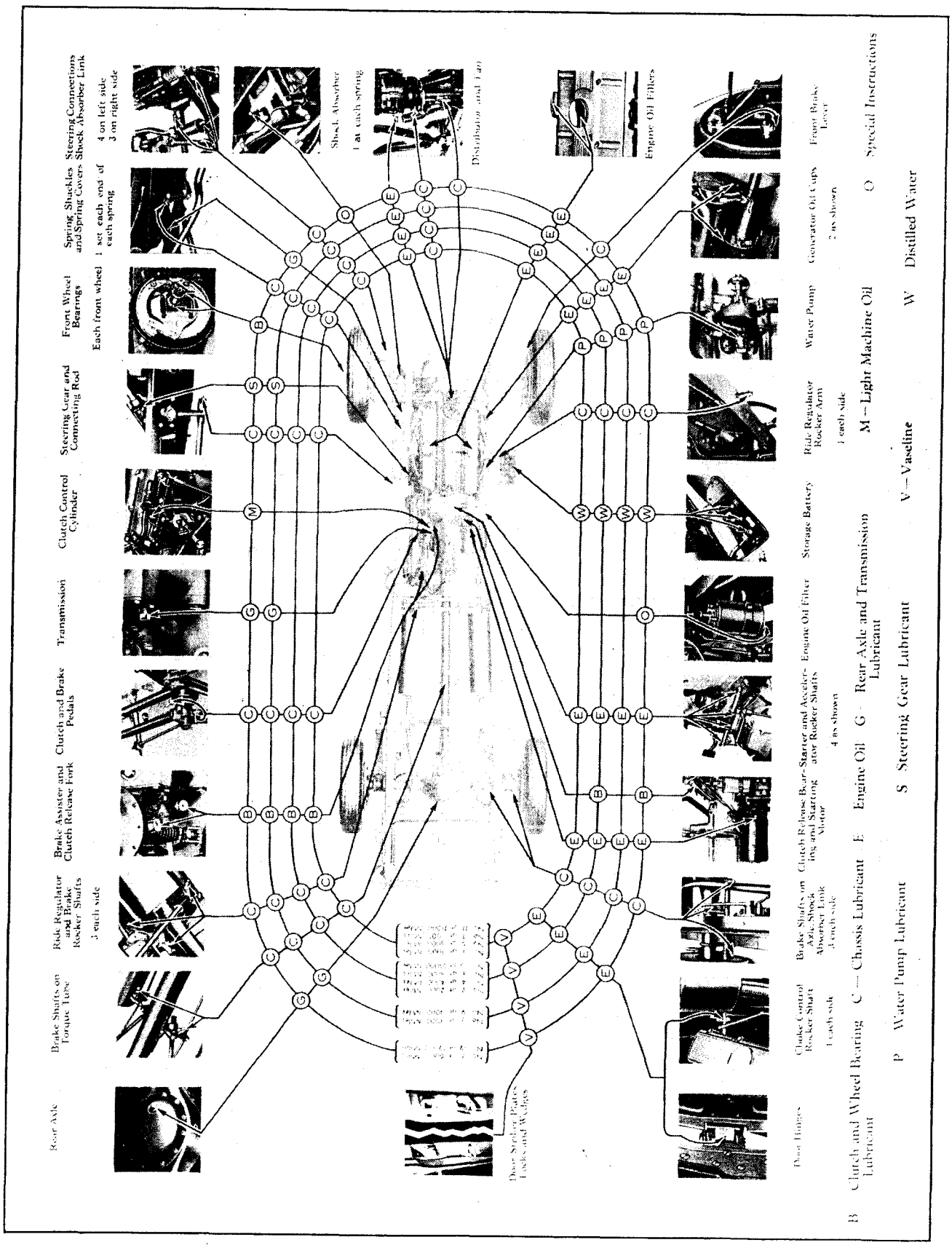


Plate 46. Lubrication Chart—Cadillac 370-B. Typical of 452-B

SPRINGS AND SHOCK ABSORBERS

General Description

SPRINGS

The springs are of the same construction on both Cadillac and LaSalle cars with the exception of size. Metal covers are used on all springs and are provided with connections for lubricating the springs.

The eye leaf of the front springs is turned up to form the front eye and down to form the rear eye. This is done to give more clearance at the shackles.

The steering modulator is incorporated at the front end of the left front spring on all cars. This device is described in more detail in the steering gear section.

A rubber bumper is installed on the frame over the front springs back of the center line of the axle. The purpose of this is to increase the caster slightly when the front springs strike the bumper, and thus help to offset the decrease in caster angle which accompanies deflection of the spring.

The spring shackle bolts and bushings are of a new design in which the bolt is threaded into the bushing. The threads not only hold the spring sidewise, but also provide a much greater bearing surface to support the vertical load. They automatically compensate for normal wear and thus, no adjustment is necessary. This threaded type construction eliminates the possibility of binding and side slap due to excessive end play.

Both the shackle bolt and the bushing are made of hardened steel.

Efficient lubrication of the spring shackles is assured as the threads act not only as a reservoir to retain the lubricant but they also distribute it to every part of the bearing surface.

In order to make the links interchangeable, they are made to receive the bolts in opposite directions; that is, each link receives the large end of one bolt and the small end of the other bolt.

SHOCK ABSORBERS

The dash controlled shock absorbers are of the two-way type and are of the same general construction on all cars.

The action of the shock absorbers is regulated by a lever mounted on the instrument panel, which, operating through a system of rods and levers, regulates the spring pressure on the control valves in the shock absorbers.

The degree of control is adjustable to five different positions and is indicated at all times by a dial gauge on the instrument panel.

The design is such that the "Free" position gives a soft "boulevard" ride. The "Firm" position gives the maximum control necessary at high speeds on rolling, gravel roads.

Service Information

1. Spring Arch

Spring arch is the distance from the center line of the bushings to the surface of the spring seat next to the axle. The spring seat surface is at the bottom of top mounted springs and at the top of underslung springs.

To measure the spring arch invert the spring on a timber or I-beam of sufficient length laid across a platform scale and apply a load by means of a jack braced against a joist or timber above. The load specification for each spring is given in the spring chart on Page 91.

2. Shock Absorber Should Contain Proper Amount of Oil

The first thing to be done in cases of complaint on springs or shock absorbers is to check the level of the oil in the shock absorbers.

Only after it is known that all shock absorbers contain the proper amount of oil should any other tests be made to determine the cause of unsatisfactory riding qualities.

SPRINGS AND SHOCK ABSORBERS

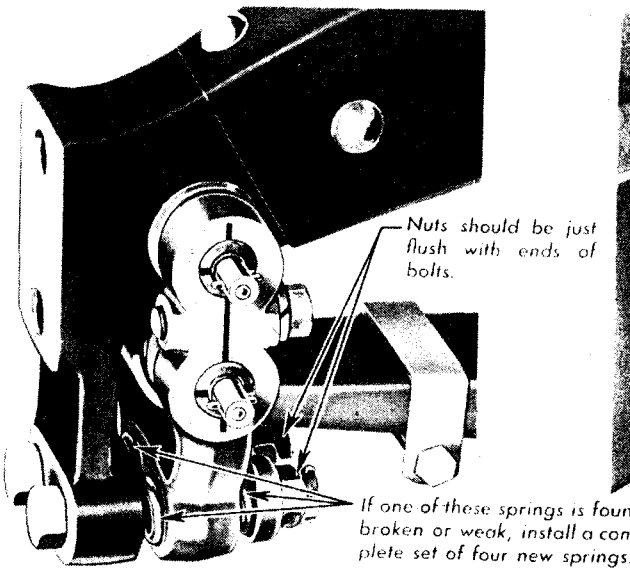


Fig. 1
Modulator on Front End of Left Front Spring

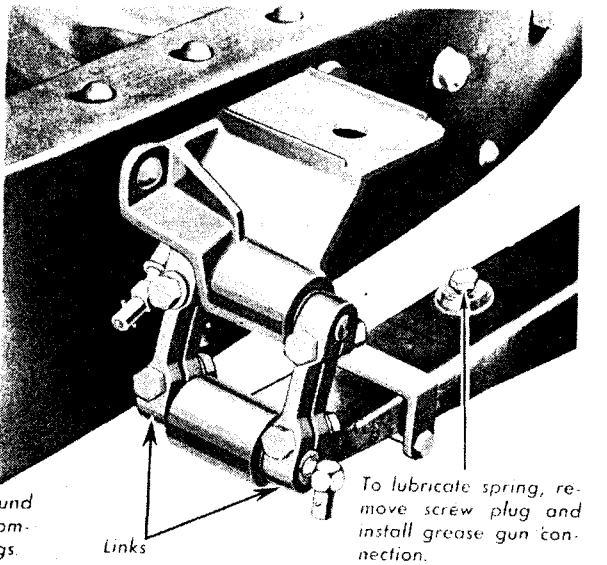


Fig. 2
Rear Spring Front Shackle

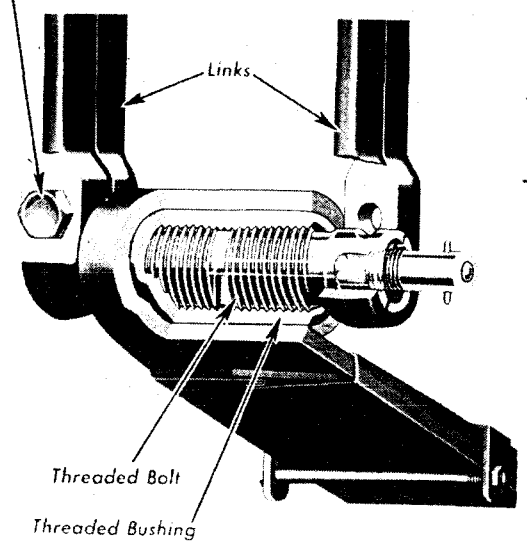


Fig. 3
Cut-away View of Spring Shackle

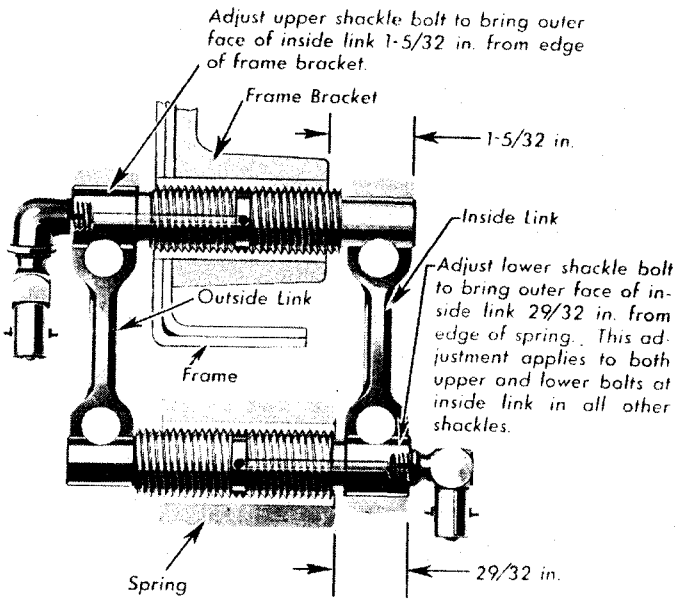


Fig. 4
Front Spring Rear Shackle

The rear shackle for the front spring must be set to a specific dimension to prevent interference between the shackle links and the frame. This is necessary because the frame tapers at this point and the frame bracket is offset with respect to the frame side bar.

Plate 47. Modulator and Spring Shackles

SPRINGS AND SHOCK ABSORBERS—Specifications

Subject and Remarks	LaSalle	Cadillac		
	345-B	355-B	370-B	452-B
Springs				
Type	Semi-Elliptic	Semi-Elliptic	Semi-Elliptic	Semi-Elliptic
Length—				
Front	39″	39″	39″	42″
Rear	58″	58″	58″	60″
Width—				
Front	2¼″	2¼″	2¼″	2¼″
Rear	2¼″	2¼″	2¼″	2½″

SPRING CHART

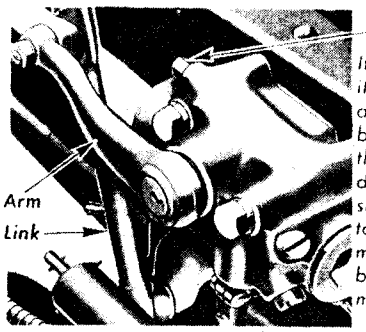
(See Note 1)

Car Model	Spring Arch		Number of Leaves	†Part Number	†Number on Springs
	*Arch in In.	Load in Lbs.			
Front Springs					
345-B, 355-B	2⅛″	1050	9	1096022	891381
370-B	2⅛″	1225	9	1096023	891383
452-B	2⅝″	1300	10	1096024	896391
355-B and 370-B (156″ W. B.) 345-B, 355-B	2⅛″	1200	9	1096071	891390
Rear Springs					
345-B, 355-B					
2-Pass. Cars, 5-Pass. Coupes	1¼″	1150	9	1096025	891391
5-Pass. Cars (except 5-Pass. Coupes)	1¼″	1300	10	1096026	891392
7-Pass. Cars (except 156″ W.B.)	1¼″	1375	11	1096084	891394
370-B					
2-Pass. Cars, 5-Pass. Coupes	1¼″	1150	9	1096025	891391
5-Pass. Cars (except 5-Pass. Coupes	1¼″	1375	10	1096083	891395
7-Pass. Cars (except 156″ W.B.)	1¼″	1475	11	1096027	891393
452-B					
2-Pass. Cars, 5-Pass. Coupes	1¼″	1225	9	1096028	896400
5-Pass. Cars (except 5-Pass. Coupes	1¼″	1425	10	1096029	896401
7-Pass. Cars	1¼″	1600	10	1096030	896402
355-B and 370-B (156″ W. B.)	1¼″	1575	10	1096072	896409

*Measure to bottom of front springs and to top of rear springs.

†Parts Division numbers of seven figures apply to springs with covers and appear only on springs furnished for service. The spring number appears on all springs.

SPRINGS AND SHOCK ABSORBERS



Refill with Delco Shock Absorber Oil. Fill to lower edge of hole.

If more than a small amount of oil is required, it indicates that air may be mixed with the oil due to the low level. This air must be expelled before normal action will be restored. To do this, set hand control lever at No. 5 position, disconnect link attached to axle and move shock absorber arm up and down by hand to circulate oil from cylinder to cylinder. Normal action is indicated by uniform resistance being offered by arm through full range of movement.

Fig. 1

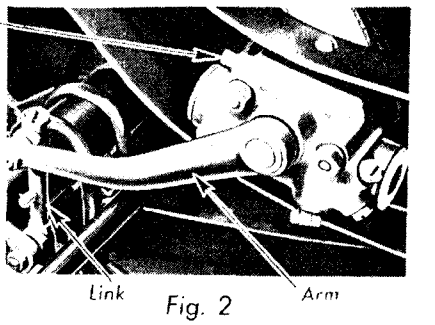


Fig. 2

Front Shock Absorber and Anchorage

Location and Identification of Shock Absorber Valves				
Valve	Front Shock Absorber		Rear Shock Absorber	
	Part No.	Identification	Part No.	Identification
Bumper	47678-D	5	47677-D	1
Snubber	*47677-D	1	*47678-D	5
Control	*47707-D	Steel finish	*47704-D	Copper finish
	†47704-D	Copper finish	†47706-D	Nickel finish

*Used on 345-B, 355-B and 370-B
†Used on 452-B *Also 452-B Front

Rear Shock Absorber and Anchorage

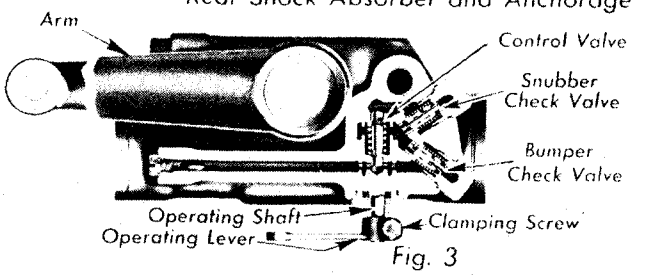
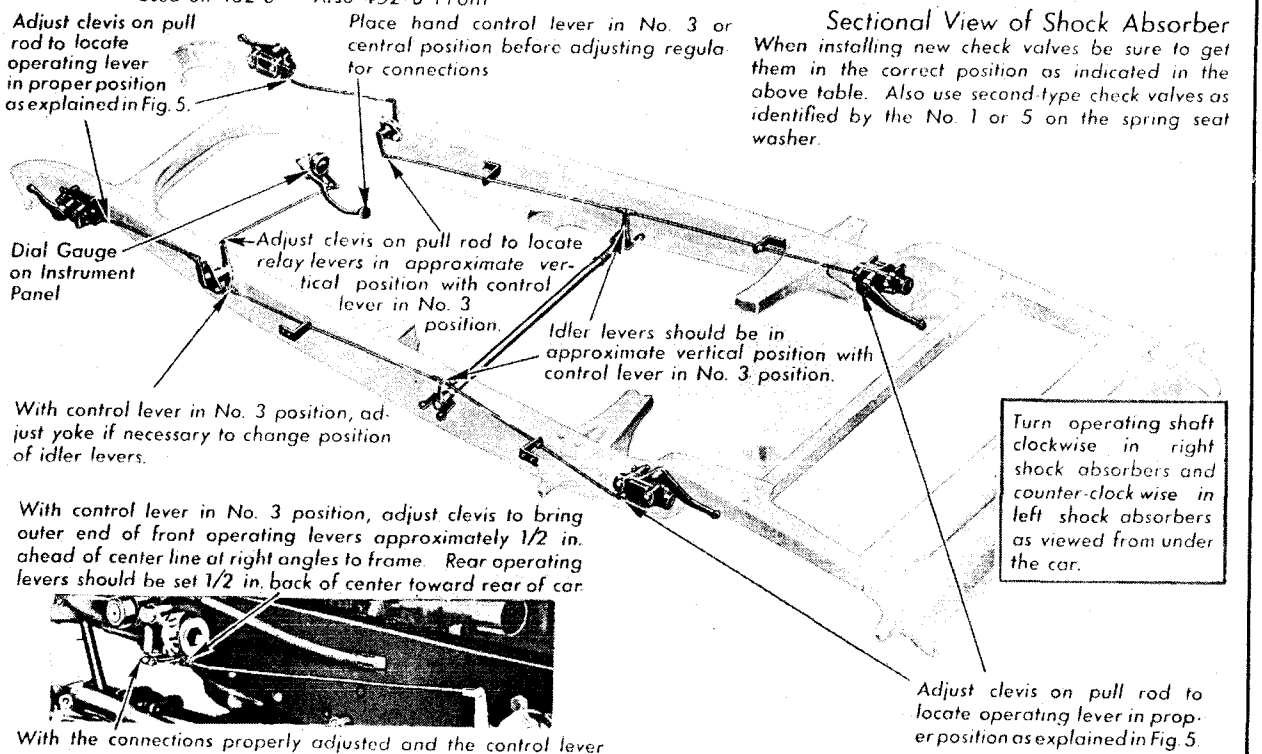


Fig. 3

Sectional View of Shock Absorber

When installing new check valves be sure to get them in the correct position as indicated in the above table. Also use second-type check valves as identified by the No. 1 or 5 on the spring seat washer.



With the connections properly adjusted and the control lever in No. 3 position, loosen clamping screws on operating levers and turn operating shafts all the way up in the shock absorbers. Then move hand control lever to No. 5 position and tighten all four clamping screws.

Fig. 4

General Arrangement of Ride Regulator Control

Proper adjustment of connections is necessary in order that each of the four shock absorbers be in exact step or agreement with the others. Adjust all connections with control lever in No. 3 position.

Fig. 5

Adjustment of Shock Absorber Control Valve

Adjustment of connections when necessary, should precede adjustment of control valve.

Plate 48. Shock Absorbers and Control

SPRINGS AND SHOCK ABSORBERS—Gen. Description—Service Information

General Description

The spring equipment on the "C" series cars is the same as on the "B" models.

The shock absorbers are the same on the "C" series Cadillac cars as on the "B" models with the exception of the control valve assembly, which is of the two-stage type. An additional or auxiliary spring is provided on the control valve to give more rigid control in the No. 4 and 5 positions of the dash ride regulator. This auxiliary spring is effective only for the last .040 in. of valve travel.

The shock absorbers used on the LaSalle 345-C are of slightly different design from those used on the Cadillac cars but they operate on identically the same principle. The LaSalle shock absorber connections are of the fabric type requiring no lubrication.

The lubrication of the "C" series shock absorbers is the same as on the "B" models. See Plate 48, page 92.

Service Information

3. Interchanging "B" and "C" Series Shock Absorbers

Only "C" series shock absorbers are furnished by the Factory Parts Division for "B" and "C" series cars. These shock absorbers can be made to apply to any "B" or "C" cars by changing the control valve to correspond to the control valve used in the shock absorber being replaced. The 345-C shock absorbers, however, may be used only on 345-C cars. See chart, page 92B, showing interchangeability of shock absorbers.

The "C" series shock absorbers, as furnished by the Factory Parts Division, are equipped with the two-stage control valve which may be identified by the inner spring in addition to the outer spring. By removing this valve, which is located under the control lever, and installing the control valve used in the shock absorber being replaced, the late type "C" series Cadillac shock absorbers may be used on all "B" and "C" series Cadillac cars.

In addition to the two two-stage control valves, four of the single-stage type are required to make the shock absorbers furnished interchangeable on "B" and "C" series cars. These valves may be identified by the finish of the springs as follows:

TWO-STAGE TYPE

1060148.....Copper finish
1060149.....Steel finish

SINGLE-STAGE TYPE

047704.....Copper finish
047706.....Nickel finish
047707.....Steel finish
047708.....Copper oxide finish

Since the control valve serves for both bumper and rebound action, it is important that the valve be placed in the shock absorber in the proper position to insure the proper action on the rebound. The valve should be placed in the shock absorber in such a way that the hollow end is toward the inside and the solid end is toward the outside. With the two-stage valve, this means that the end containing the inner spring should be toward the outside of the shock absorber.

All 452-B as well as 452-C shock absorbers should be equipped with the two-stage control valves. Some 452-B cars, however, may be found equipped with single-stage valves and in such cases all four control valves should be changed, using valve, Part No. 1060149, in the front and Part No. 1060148 in the rear shock absorbers.

Two check valves are furnished for service, but replacement should ordinarily be with valves of the same type as the ones removed. Any change in the arrangement of the check valves as furnished on the car and in the shock absorbers supplied for service should be made only in individual cases to correct specific difficulties.

The two check valves may be distinguished by the number stamped on the spring seat washer. The check valves furnished are as follows:

Part No.	Identification
047677	Stamped 1
047678	Stamped 5

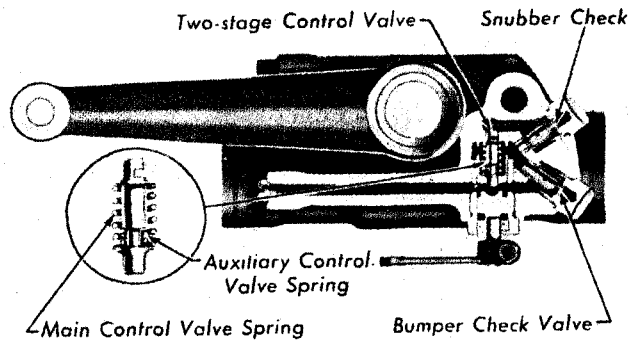


Fig. 1

Sectional View of Shock Absorber—
Cadillac 355-C, 370-C, 452-C

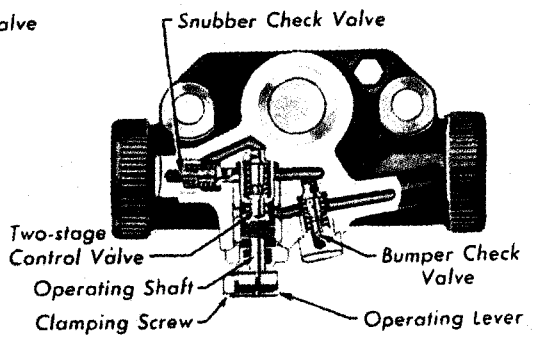


Fig. 2

Sectional View of LaSalle 345-C Shock Absorber

Plate 48A. Shock Absorbers—"C" Series Cars

SPRINGS AND SHOCK ABSORBERS

CHART SHOWING
INTERCHANGEABILITY OF "B" AND "C" SERIES SHOCK ABSORBERS

SERIES (Chassis Unit Nos.)	SHOCK ABSORBERS Part No. and Location	VALVE ARRANGEMENT		
		Control Valve	Check Valves	
			Bumper (Identification)	Snubber (Identification)
345-B all cars 355-B except 156" W. B. 355-C before chassis unit 30-47 370-B except 156" W. B. 370-C before chassis unit 40-32	040619 Right Front 040617 Left Front 040621 Right Rear 040623 Left Rear	Remove 1060149 Install 047707 (Steel Finish) Remove 1060148 Install 047704 (Copper Finish)	047678 (marked 5) 047677 (marked 1)	047677 (marked 1) 047678 (marked 5)
355-B 156" W. B. only 370-B 156" W. B. only	040619 Right Front 040617 Left Front 040621 Right Rear 040623 Left Rear	Remove 1060149 Install 047704 (Copper Finish) Remove 1060148 Install 047706 (Nickel Finish)	047678 (marked 5) 047677 (marked 1)	047677 (marked 1) 047678 (marked 5)
345-C before chassis unit 20-266 Also 345-C from chassis unit 20-280 to 20-311	1054077 Right Front 1054075 Left Front 1054081 Right Rear 1054079 Left Rear	Remove 1060149 Install 047708 (Copper Oxide) Remove 1060148 Install 047706 (Nickel Finish)	047678 (marked 5) 047678 (marked 5)	047678 (marked 5) 047678 (marked 5)
345-C from chassis unit 20-265 to 20-280 Also 345-C after chassis unit 20-310	1054077 Right Front 1054075 Left Front 1054081 Right Rear 1054079 Left Rear	1060149 as furnished 1060148 as furnished	047678 (marked 5) 047678 (marked 5)	047678 (marked 5) 047678 (marked 5)
355-C after chassis unit 30-46 370-C after chassis unit 40-31 *452-B, 452-C all cars	040619 Right Front 040617 Left Front 040621 Right Rear 040623 Left Rear	1060149 as furnished 1060148 as furnished	047678 (marked 5) 047677 (marked 1)	047677 (marked 1) 047678 (marked 5)

*Replace control valves of any 452-B shock absorbers having single-stage type.

STEERING GEAR

General Description

STEERING GEAR

Cadillac and LaSalle steering gears are of the hour-glass type. The 452-B steering gear differs from the other Cadillac units in dimensions only. The LaSalle differs from the others in the lighting switch, the length of the column and the mounting flange.

The steering gear is mounted with the sector shaft inclined upward at an angle with the frame to provide sufficient clearance and proper alignment of the steering connecting rod with the steering arm.

The steering wheel has three spokes to give full vision of the instrument panel. It has a steel core with the hub, the spokes and the rim welded into one piece. The core is covered with hard rubber composition, which construction gives a sturdy yet light, easily gripped wheel.

STEERING MODULATOR

The steering modulator is designed to prevent shimmy and steering wheel whip. To accomplish this the front shackle of the left front spring floats between two pairs of stiff coil springs. With this arrangement, the modulator springs absorb the road shocks which might otherwise be transmitted to the steering wheel.

Service Information

1. Steering Gear Complaints

In case of complaints on hard steering or nervousness, first check the front tires to see that they are properly inflated and installed correctly to preserve proper wheel balance. Also check the wheel balance and adjust as necessary.

Hard steering is more often caused by incorrectly adjusted steering connections than by improper steering gear adjustment. Therefore, before adjusting the steering gear to take care of a complaint of hard steering, be sure to check the steering knuckles and connections to make sure that they are perfectly free.

Steering wheel nervousness is in many cases due to improper adjustment of the steering modulator. In a case of this complaint, therefore, always inspect this adjustment before attempting to adjust the steering gear itself.

If these operations do not correct the difficulty, the steering gear should be readjusted.

Specifications

Subject and Remarks	LaSalle	Cadillac		
	345-B	355-B	370-B	452-B
Connecting Rod (Drag Link)				
Joint springs—				
Free length	$\frac{31}{32}$"	$\frac{31}{32}$"	$\frac{31}{32}$"	$\frac{31}{32}$"
Pressure in pounds when compressed to $\frac{7}{8}$ in.	175-225	175-225	175-225	175-225
Steering Gear				
Complaints (See Note 1)	.....	.....	.....	.....
Clearance between—				
Sector shaft and eccentric bushing				
New limits	.00075-.0025"	.00075-.0025"	.00075-.0025"	.00075-.0025"
Worn limits, not over	.005"	.005"	.005"	.005"
Ratio (steering gear only)	17 to 1	17 to 1	17 to 1	17 to 1
Steering wheel diameter	18½"	18½"	18½"	18½"

STEERING GEAR

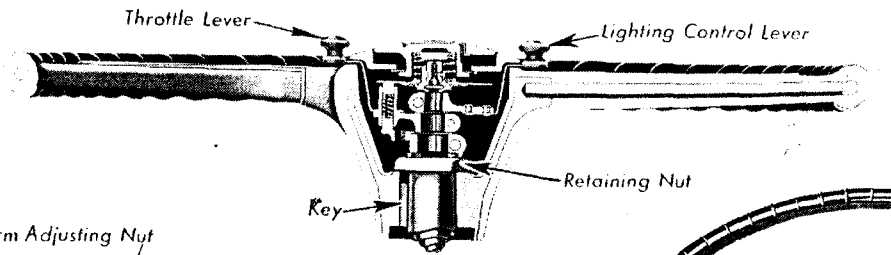


Fig. 1
Typical Steering Wheel and Control

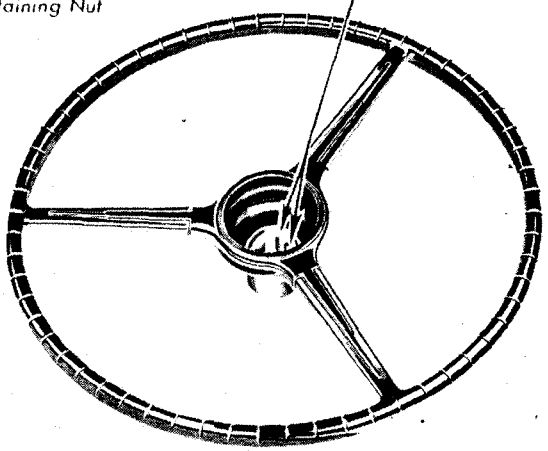


Fig. 2

With the front road wheels straight ahead, one of the steering wheel spokes should be straight up. If the steering wheel is not in this position, it should be relocated on the steering shaft by using the keyway that will bring it nearest the proper position.

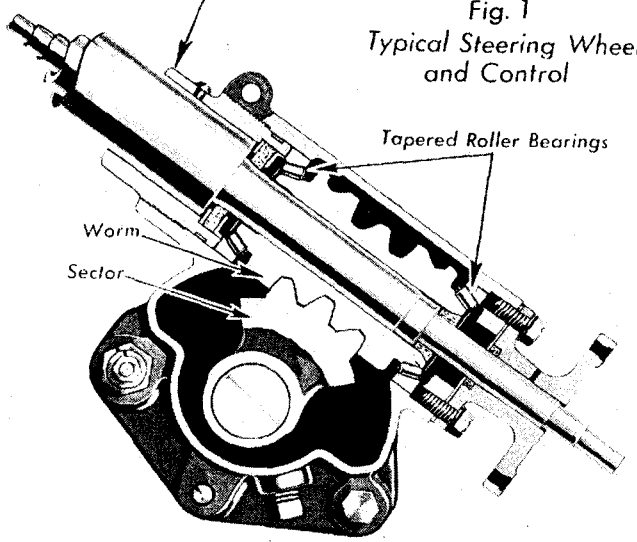


Fig. 3
Sectional View of Steering Gear

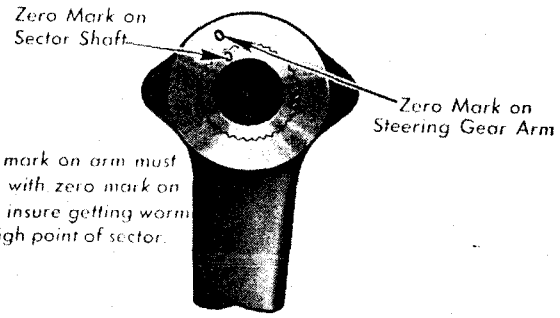


Fig. 5
Zero Marks on Steering Gear Arm and Sector Shaft

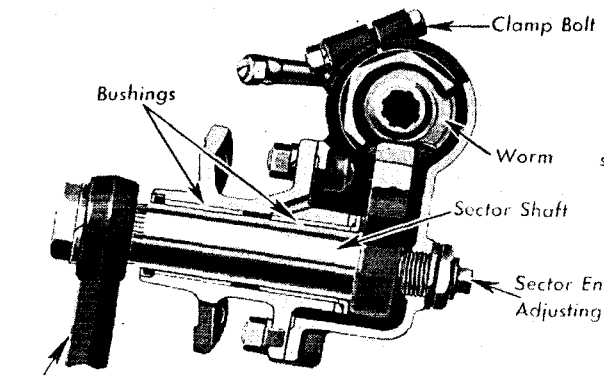


Fig. 4
Sector Shaft

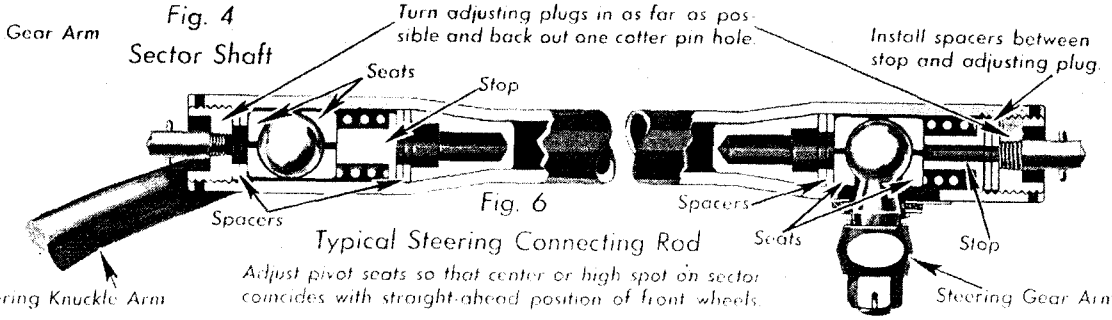


Fig. 6
Typical Steering Connecting Rod

Adjust pivot seats so that center or high spot on sector coincides with straight-ahead position of front wheels.

Plate 49. Steering Gear and Connections

STEERING GEAR—Specifications

Subject and Remarks	LaSalle	Cadillac		
	345-B	355-B	370-B	452-B
Steering Gear—Cont'd				
Turning radius—				
Radius of circle swept by tread center of front tire				
Left				
130 in. W. B.	21′ 6″	.....	.....	.....
134 in. W. B.	.....	22′ 0″	23′ 0″	.....
136 in. W. B.	23′ 1″	.....	.....	.....
140 in. W. B.	.....	23′ 2″	24′ 6″	.....
143 in. W. B.	.....	.....	.....	25′ 5″
149 in. W. B.	.....	.....	.....	27′ 0″
Right				
130 in. W. B.	21′ 1″	.....	.....	.....
134 in. W. B.	.....	21′ 10″	22′ 0″	.....
136 in. W. B.	22′ 8″	.....	.....	.....
140 in. W. B.	.....	22′ 4″	22′ 4″	.....
143 in. W. B.	.....	.....	.....	23′ 5″
149 in. W. B.	.....	.....	.....	24′ 2″
Type	Hour-glass worm and sector	Hour-glass worm and sector	Hour-glass worm and sector	Hour-glass worm and sector
Unit number location	.....	.....	.....	.....
All models—on top of steering gear housing				
Steering Modulator				
Springs—				
Free length (approximately)	1½″	1½″	1½″	1½″
Pressure in pounds when compressed to 1 3/16 in.	95-105	95-105	95-105	95-105

STEERING GEAR

Note: Adjustment of steering connections, knuckle bolts and wheel bearings, inspection of steering cross rod and connecting-rod springs, checking caster, alignment and balance of front wheels, lubricating steering system and checking tire inflation should precede adjustment of steering gear. Remove steering connecting-rod before adjusting steering gear.

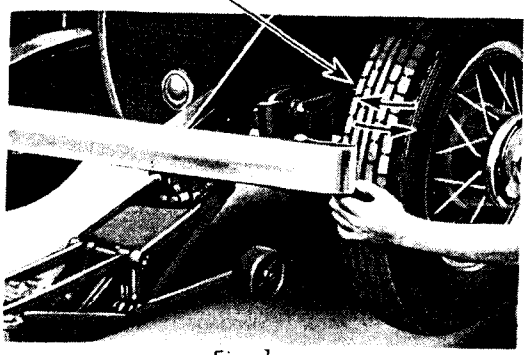


Fig. 1
The modulator shackle should move freely when tested in this manner

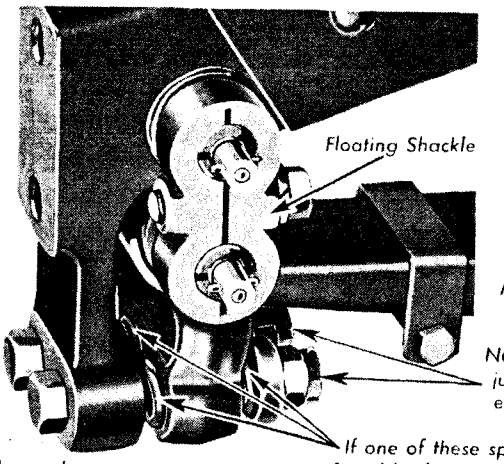


Fig. 2
Steering Modulator

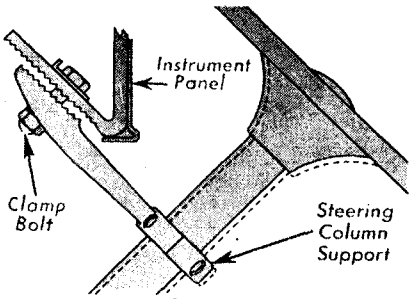
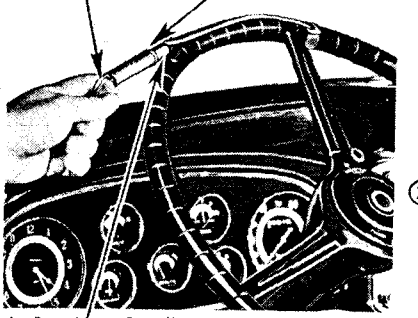


Fig. 3
Binding due to incorrect alignment of steering column can be corrected by adjusting support on instrument board.



Scale Reading—2-3 lbs. for worm adjustment. (See Operation 3, Fig. 5).

Fig. 4
Checking pull necessary to turn steering wheel

Tire Inflation

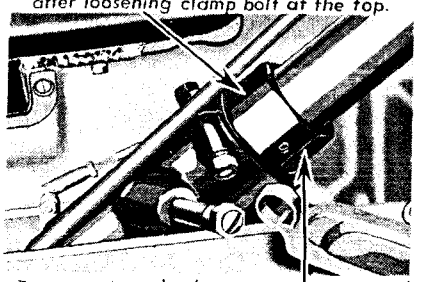
ORDINARY DRIVING

All Wheels — — 40 lbs.

HIGH SPEEDS

Front Wheels — — 45 lbs.

① Back worm adjusting nut off slightly after loosening clamp bolt at the top.

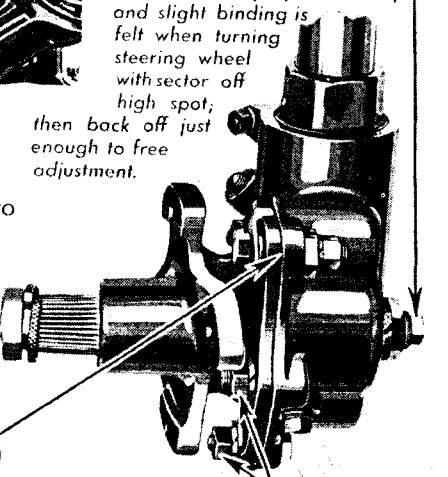


③ Turn steering wheel to extreme right and tighten worm adjusting nut until a pull of 2-3 lbs. at rim of steering wheel is necessary to move the wheel toward the left. Check pull after tightening clamp bolt.

Fig. 5
Adjustment for Up-and-Down Play in Worm

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.

② Turn adjusting screw in against sector until all play is taken up and slight binding is felt when turning steering wheel with sector off high spot; then back off just enough to free adjustment.



④ Turn eccentric to adjust backlash between worm and sector and to give a pull of 5-6 lbs. on steering wheel with sector on high point.

Fig. 6
Adjustments for End Play in Sector Shaft and Backlash Between Worm and Sector

Plate 50. Steering Gear Adjustments

TRANSMISSION

General Description

The Synchro-mesh transmission is used on both Cadillac and LaSalle cars and is of the same construction on all models.

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 lined with a bronze ring and a steel cone on the gear.

The synchronizing drums are operated by rocking yokes pivoted on eccentrics which are fastened to adjusting quadrants on the outside of the transmission case. These quadrants are graduated as a guide to the amount of movement. Moving these plates up or down shortens or lengthens the yoke travel.

The rocking movement of the yokes is accomplished through cams machined on the shifter shaft. These cams engage the rollers of the two plungers which can be moved up and down in cylinders, or dashpots, filled with oil, in the upper part of the yokes.

The synchronizing mechanism is not necessary on the low and reverse gears because shifting into the low and reverse speed positions is only required when the car is standing still.

Helical gears are used to give complete running silence in all forward speeds, low as well as second. The teeth of these gears are cut at an angle of 45 degrees, giving maximum overlap, and are accurately ground and lapped after hardening, insuring quiet operation under all running conditions.

Gear silence is further assured by the use of large anti-friction bearings which hold the gears rigidly in alignment. The constant-mesh gears on the main shaft run on tapered roller bearings, while the main shaft and countershaft are carried in large ball bearings.

The rear end of the transmission is used as an additional point of support for the engine. This support consists of two arms on the ball joint socket at the rear of the transmission. These arms have flat serrated surfaces which engage similar surfaces on supports mounted in rubber on the frame. Each arm is attached to the support by two through bolts.

Service Information

1. Transmission Requires New Lubricant in Springtime

The lubrication schedule specifies that transmission lubricant should be drained and replaced at the beginning of warm weather.

This is particularly important on synchro-mesh transmissions because if it is not done, the thinned lubricant will affect the operation of the synchronizing mechanism. The transmission may clash if the lubricant is too thin.

In servicing a transmission for shifting, the very first thing to do is to make sure that the proper amount of the correct lubricant is used.

2. Installation of Speedometer Cable Flange

Two different distances between centers of speedometer driving gear and driven gear are used, one for pinions with 15 to 19 teeth and one for pinions with 20 to 24 teeth. 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 15 to 19 teeth. When revolved 180 deg. the cable gives the correct center distance for pinions with 20 to 24 teeth. The flange on the cable end has the figures "15-19" on one side and "20-24" on the other side. The cable should always be turned so that the figures corresponding to the number of teeth on the pinion are at the top.

3. Determining Correct Speedometer Gear by Rolling Radius

Occasionally there are 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.

TRANSMISSION

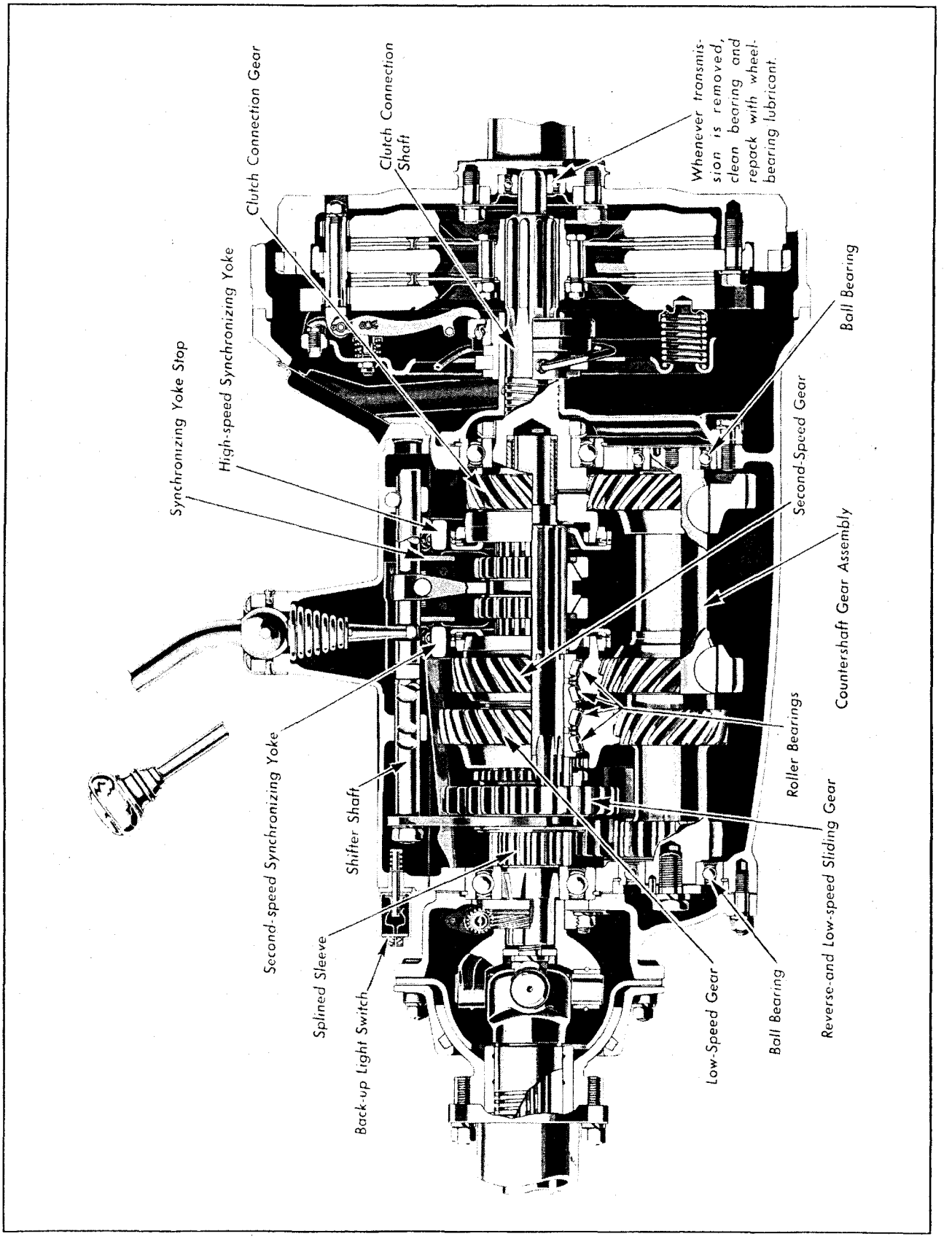


Plate 51. Sectional View of Transmission, Typical of all Models

TRANSMISSION—Specifications

Subject and Remarks	LaSalle	Cadillac		
	345-B	355-B	370-B	452-B
Gear ratios—				
Low speed	2.40 to 1	2.40 to 1	2.40 to 1	2.40 to 1
Second speed	1.47 to 1	1.47 to 1	1.47 to 1	1.47 to 1
High speed (direct drive)	1 to 1	1 to 1	1 to 1	1 to 1
Reverse speed	2.49 to 1	2.49 to 1	2.49 to 1	2.49 to 1
Lubrication (See Note 1) *See Lubrication Section*	.....	.....	.....	.....
Unit number location	.....	.....	.....	.....
All models—on flange next to flywheel bell housing at upper L. H. side.				
Mainshaft Assembly				
Clearance between—				
Splines on mainshaft and splineways on drums.				
New limits	.0065-.009″	.0065-.009″	.0065-.009″	.0065-.009″
Worn limit, not over	.015″	.015″	.015″	.015″
Splines on mainshaft and splineways in sliding gear coupling.				
New limits	.0005-.0015″	.0005-.0015″	.0005-.0015″	.0005-.0015″
Worn limits	.005″	.005″	.005″	.005″
Splines on mainshaft and splineways in sleeve for gear.				
New limits	.000-.001″	.000-.001″	.000-.001″	.000-.001″
Worn limit, not over	.003″	.003″	.003″	.003″
Splines on mainshaft sleeve and splineways in reverse gear.				
New limits	.0005-.0015″	.0005-.0015″	.0005-.0015″	.0005-.0015″
Worn limit, not over	.005″	.005″	.005″	.005″
Clutch connection shaft out of true, not over	.0025″	.0025″	.0025″	.0025″
Main shaft out of true, not over	.0025″	.0025″	.0025″	.0025″
Reverse Idler Gear Assembly				
Clearance between bushing and shaft				
New limits	.0008-.0023″	.0008-.0023″	.0008-.0023″	.0008-.0023″
Worn limit, not over	.004″	.004″	.004″	.004″
Reaming size for bushing	.938-.939″	.938-.939″	.938-.939″	.938-.939″
End play in gear, not over	.025″	.025″	.025″	.025″
Shifting Mechanism				
Clearance between shifter fork and shifter gear or sliding coupling				
New limits	.012-.020″	.012-.020″	.012-.020″	.012-.020″
Worn limit, not over	.035″	.035″	.035″	.035″
Shifter shaft lock spring				
Free length (approximately)	$1\frac{3}{16}$″	$1\frac{3}{16}$″	$1\frac{3}{16}$″	$1\frac{3}{16}$″
Pressure in pounds when compressed to $\frac{3}{4}$ in.	20-23	20-23	20-23	20-23
Yoke Assembly				
Clearance between—				
Guide block and drum (R. H. high and L. H. second speeds)				
New limits	.002-.006″	.002-.006″	.002-.006″	.002-.006″
Worn limit, not over	.010″	.010″	.010″	.010″
Guide block and drum (R. H. second and L. H. high speeds)				
New limits	.007-.011″	.007-.011″	.007-.011″	.007-.011″
Worn limit, not over	.015″	.015″	.015″	.015″
Plunger and yoke bore				
New limits	.002-.006″	.002-.006″	.002-.006″	.002-.006″
Worn limit, not over	.008″	.008″	.008″	.008″
Plunger main spring—				
Free length (approximately)	$1\frac{1}{64}$″	$1\frac{1}{64}$″	$1\frac{1}{64}$″	$1\frac{1}{64}$″
Pressure in pounds when compressed to $\frac{9}{16}$ in.	24-26	24-26	24-26	24-26
Plunger valve spring—				
Free length (approximately)	$\frac{5}{8}$″	$\frac{5}{8}$″	$\frac{5}{8}$″	$\frac{5}{8}$″
Pressure in pounds when compressed to $\frac{7}{16}$ in.	$2\frac{3}{4}$-$3\frac{1}{4}$	$2\frac{3}{4}$-$3\frac{1}{4}$	$2\frac{3}{4}$-$3\frac{1}{4}$	$2\frac{3}{4}$-$3\frac{1}{4}$
Yoke return spring—				
Free length inside loops (approximately)	$2\frac{3}{16}$″	$2\frac{3}{16}$″	$2\frac{3}{16}$″	$2\frac{3}{16}$″
Tension in pounds when stretched to $2\frac{7}{8}$ in.	8-$8\frac{1}{2}$	8-$8\frac{1}{2}$	8-$8\frac{1}{2}$	8-$8\frac{1}{2}$
Yoke throw from neutral to applied position	$\frac{3}{32}$-$\frac{5}{32}$″	$\frac{3}{32}$-$\frac{5}{32}$″	$\frac{3}{32}$-$\frac{5}{32}$″	$\frac{3}{32}$-$\frac{5}{32}$″

TRANSMISSION

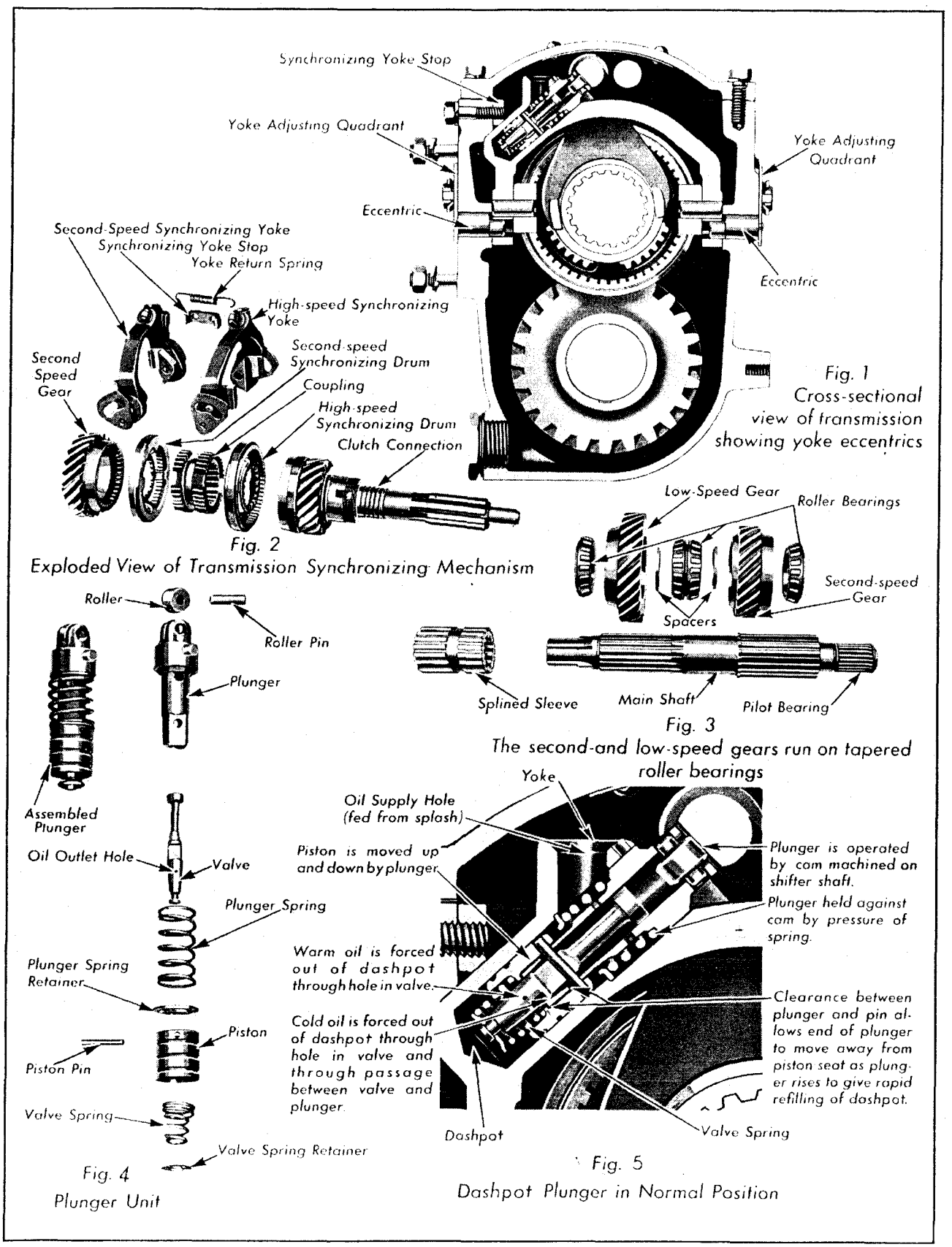


Plate 52. Transmission Synchronizing Mechanism

TRANSMISSION—Specifications—Speedometer Pinion Chart

Subject and Remarks	LaSalle	Cadillac		
	345-B	355-B	370-B	452-B
Universal Joint				
Clearance between—				
Crosses and bushings				
New limits	.0025-.004"	.0025-.004"	.0025-.004"	.0025-.004"
Worn limit, not over	.006"	.006"	.006"	.006"
Yoke and ball member bushing				
New limits	.005-.007"	.005-.007"	.005-.007"	.005-.007"
Worn limit, not over	.010"	.010"	.010"	.010"
Speedometer Gears				
Cable flange (See Note 2)	.....	.....	.....	.....
Driving gear (7 teeth)				
Part number	848176	848176	848176	848176
Rolling radius, determining (See Note 3)	.....	.....	.....	.....

SPEEDOMETER PINION CHART

Car Model	Gear Ratio	Number of Teeth on Pinion	Part Number	Rolling Radius
452-B (7.50 x 18 in. Tires)	4.31 to 1	21	848123	14 to 14⅜ in. (Fast) 14⅜ in. 14⅜ to 14⅝ in. (Slow)
		20	848122	14⅝ to 15 in. (Fast) 15 in. 15 to 15⅜ in. (Slow)
		19 (Standard)	848178	15⅜ to 15⅞ in. (Fast) 15⅞ in. 15⅞ to 16⅛ in. (Slow)
		18	848177	16⅛ to 16¾ in. (Fast) 16¾ in. 16¾ to 17⅛ in. (Slow)
		17	848179	17⅛ to 17¾ in. (Fast) 17¾ in. 17¾ to 18 in. (Slow)
345-B, 355-B (7.00 x 17 in. Tires)	4.36 to 1	22	848124	13½ to 13⅞ in. (Fast) 13⅞ in. 13⅞ to 14⅛ in. (Slow)
		21	848123	14⅛ to 14½ in. (Fast) 14½ in. 14½ to 14¾ in. (Slow)
		20 (Standard)	848122	14¾ to 15¼ in. (Fast) 15¼ in. 15¼ to 15½ in. (Slow)
		19	848178	15½ to 16 in. (Fast) 16 in. 16 to 16¼ in. (Slow)
		18	848177	16¼ to 16½ in. (Fast) 16½ in. 16½ to 16¾ in. (Slow)
345-B, 355-B (7.00 x 17 in. Tires) 370-B (7.50 x 17 in. Tires)	4.60 to 1	23	848125	13⅝ to 14 in. (Fast) 14 in. 14 to 14¼ in. (Slow)
		22 (Standard on 345-B, 355-B)	848124	14¼ to 14⅝ in. (Fast) 14⅝ in. 14⅝ to 14⅞ in. (Slow)

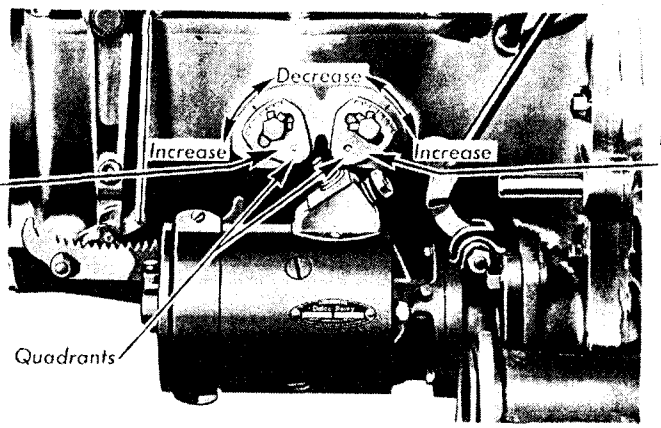
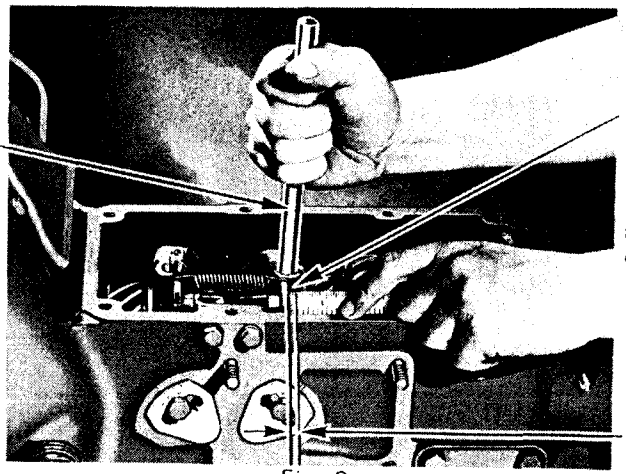


Fig. 1

Quadrants for adjusting yoke travel

To adjust yoke travel, move two quadrants for each yoke equal distances and locate them in same position to keep yoke pivots in proper alignment.

Use pry bar with shoulder to prevent burring edges of oil supply hole. Use just enough pressure to engage drum with cone.



Measure travel of yoke from neutral to extreme rear position to determine clearance between rear drum and cone. Repeat in opposite direction on front yoke for front drum and cone.

3/32 – 5/32 in. Travel

Fig. 2

Measuring Yoke Travel

Remove transmission cover to check yoke travel. Adjust yoke travel by moving quadrants as shown in Fig. 1.

Second-speed Yoke with Plunger, Part No. 1096038.

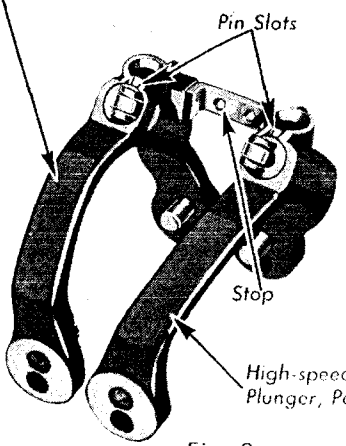


Fig. 3

First-type yokes have the pin slots in line with direction of travel. Second-type yokes have the slots at right angles to the direction of travel between the oil reservoir and dashpot. Only second-type yokes are supplied for service.

For first-type second-and high-speed yokes.

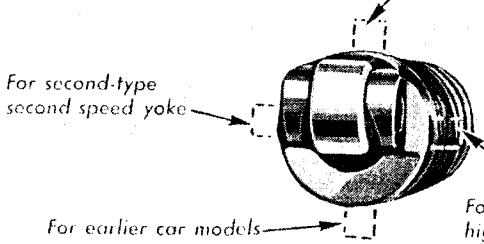


Fig. 4

Service plungers, Part No. 1096037, are furnished with pin unassembled so that pin can be installed in proper position for first-or second-type yokes or for earlier car models. Install pin in position indicated for model on which plunger is to be used.

Plate 53. Transmission Adjustments

TRANSMISSION—Speedometer Pinion Chart

SPEEDOMETER PINION CHART—Continued

Car Model	Gear Ratio	Number of Teeth on Pinion	Part Number	Rolling Radius
452-B (7.50 x 18 in. Tires)	4.64 to 1	21 (Standard on 370-B)	848123	14⅞ to 15⅜ in. (Fast) 15⅜ in. 15⅜ to 15⅝ in. (Slow)
		20	848122	15⅝ to 16⅛ in. (Fast) 16⅛ in. 16⅛ to 16⅜ in. (Slow)
		19	848178	16⅜ to 17 in. (Fast) 17 in. 17 to 17⅜ in. (Slow)
		23	848125	13¾ to 14⅛ in. (Fast) 14⅛ in. 14⅛ to 14⅜ in. (Slow)
		22	848124	14⅜ to 14¾ in. (Fast) 14¾ in. 14¾ to 15 in. (Slow)
		21	848123	15 to 15½ in. (Fast) 15½ in. 15½ to 15¾ in. (Slow)
		20 (Standard)	848122	15¾ to 16¼ in. (Fast) 16¼ in. 16¼ to 16½ in. (Slow)
		19	848178	16½ to 17⅛ in. (Fast) 17⅛ in. 17⅛ to 17½ in. (Slow)
370-B (7.50 x 17 in. Tires)	4.80 to 1	24		13⅝ to 14 in. (Fast) 14 in. 14 to 14¼ in. (Slow)
		23	848125	14¼ to 14⅝ in. (Fast) 14⅝ in. 14⅝ to 14⅞ in. (Slow)
		22 (Standard)	848124	14⅞ to 15¼ in. (Fast) 15¼ in. 15¼ to 15½ in. (Slow)
		21	848123	15½ to 16 in. (Fast) 16 in. 16 to 16¼ in. (Slow)
		20	848122	16¼ to 16¾ in. (Fast) 16¾ in. 16¾ to 17¼ in. (Slow)

TRANSMISSION

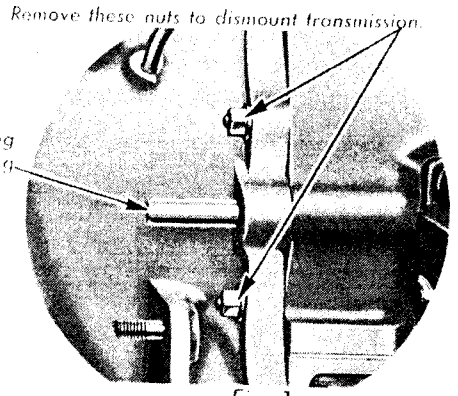


Fig. 1
Removing Transmission from Engine

When reinstalling the transmission, the front engine support bolts may be loosened to permit the rubber cushions at all supports to equalize; the transmission rear support through bolts are then tightened and the front engine support bolts adjusted as explained in Plate 33, Fig. 4.

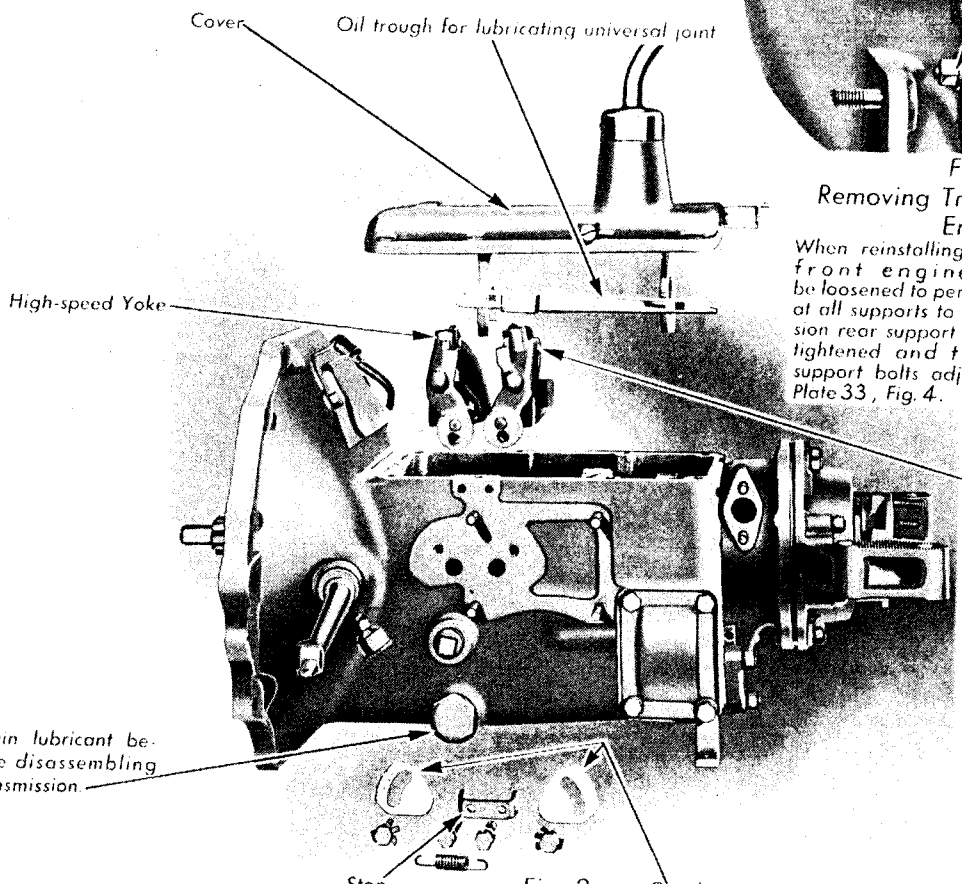


Fig. 2
The first step in disassembling the transmission is to remove the cover and synchronizing yokes. The remaining operations are performed in the manner and order shown in the following illustrations.

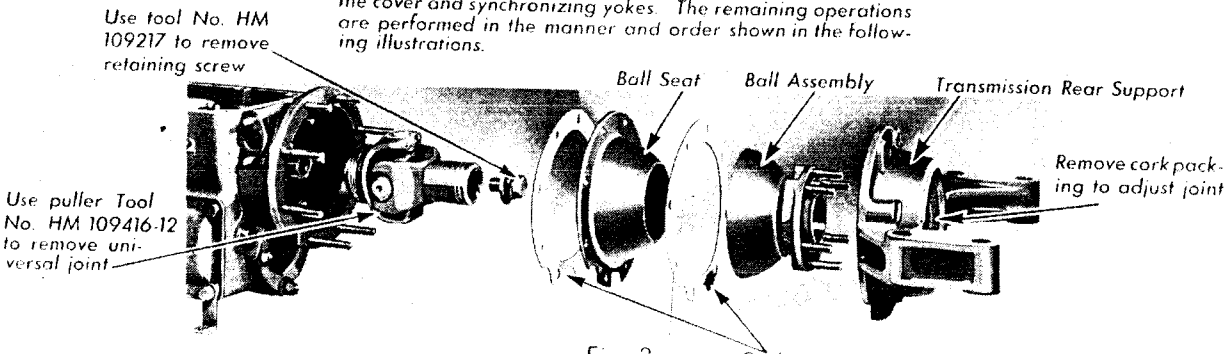


Fig. 3
Universal Joint Housing and Transmission Rear Support Disassembled

To adjust ball and socket joint, remove gaskets until friction can be felt and then add one .005 in. gasket. Oil grooves in bushing must cross on right side and open toward top and bottom of ball.

Plate 54. Removal and Disassembly of Transmission

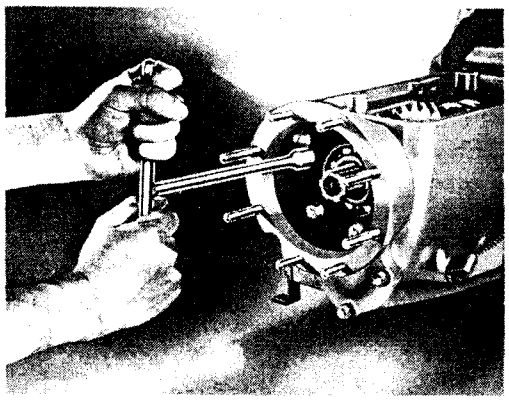


Fig. 4 (Left)
Removing retaining screws to remove universal joint housing

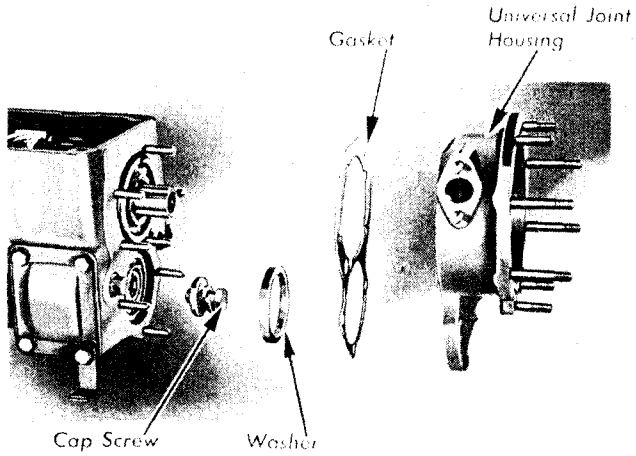


Fig. 5 (Right)
Exploded View of Universal Joint Housing and Countershaft Rear Bearing Washer

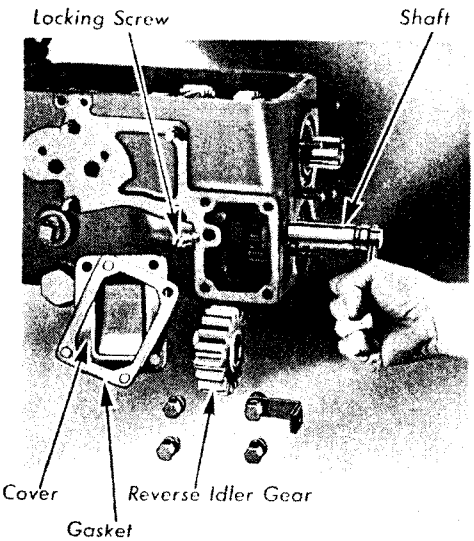


Fig. 6 (Left)
Removing reverse idler gear

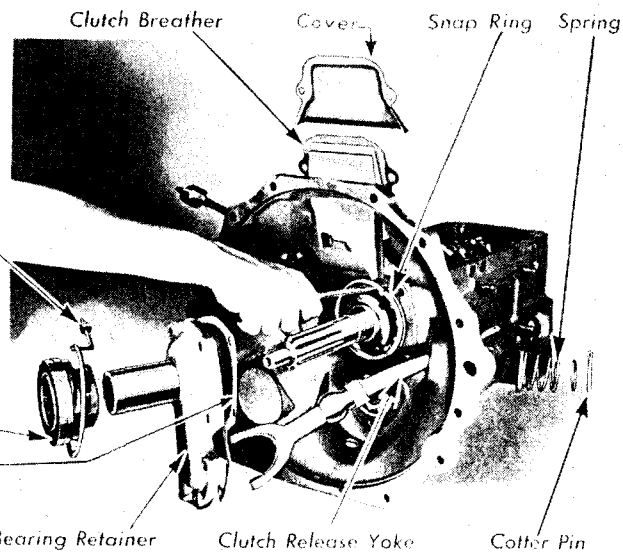


Fig. 7 (Right)
Removing snap ring from clutch connection bearing

Plate 55. Disassembly of Transmission

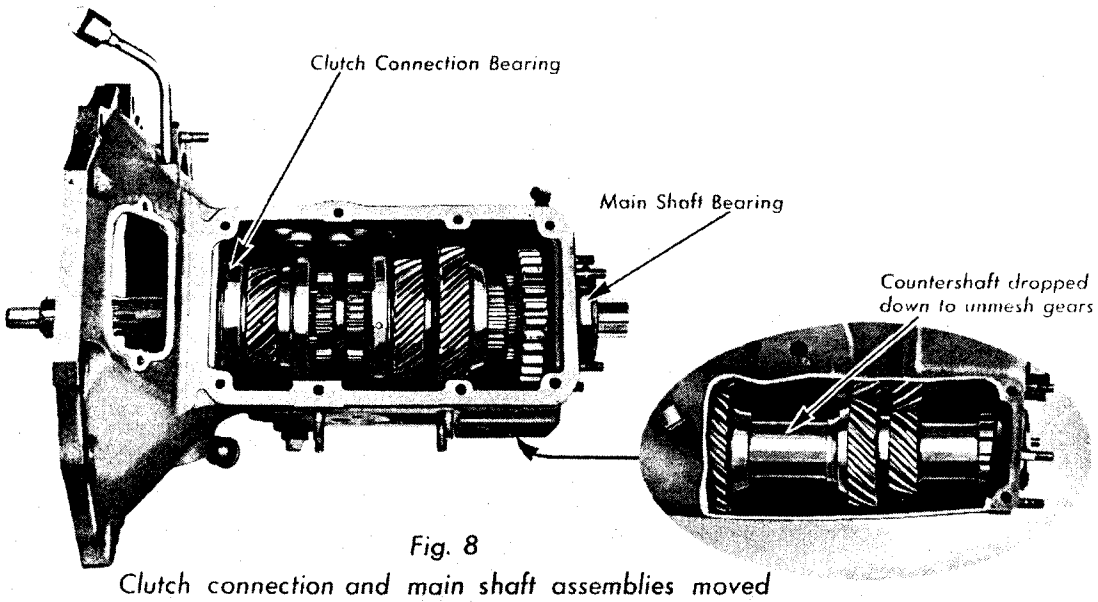


Fig. 8

Clutch connection and main shaft assemblies moved toward rear of transmission case to unmesh gears

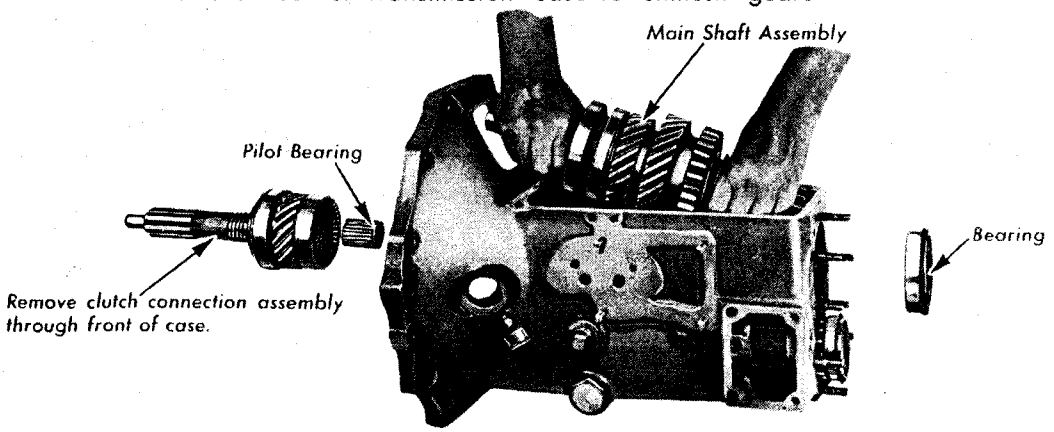


Fig. 9

Removing main shaft assembly from top of case

The main shaft is disassembled by pulling off splined sleeve together with the low-and second-speed gears and bearings.

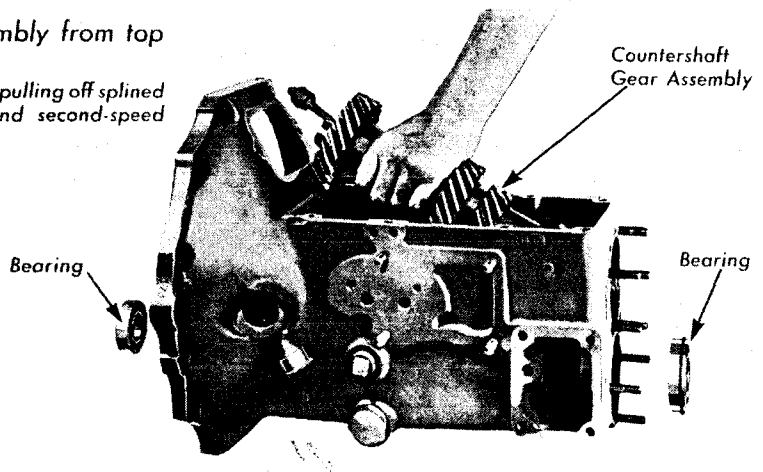


Fig. 10

Removing countershaft gear assembly from top of case

Plate 56. Disassembly of Transmission

4. Replacing Reverse and Low Speed Sleeve in "B" Series Cars

The sleeve, part number 892490, on the main shaft for the first and reverse speed gear of the "B" series transmission, has been furnished in two lengths. Sleeves of one length are $3\frac{3}{32}$ in. long while the other is $\frac{1}{16}$ in. longer.

When the longer sleeve is installed in place of the shorter, it may not be possible to get sufficient travel on the second speed synchronizing drum without first removing the $\frac{1}{16}$ in. spacer, part number 890493, located between the rear end of the sleeve and the rear main shaft bearing.

Whenever the sleeve is removed from a transmission for replacement, it should be compared with the new sleeve and if the new sleeve is $\frac{1}{16}$ in. longer, the spacer should be removed. The longer sleeve fully compensates for the spacer.

5. Installing Second-Type Gear Shift Levers

Beginning with transmission unit 30-2250, a second type gear shift lever is used. This lever differs from the first type lever in that the knob on the lower end is .010 in. oversize and has its sides machined flat to fit more accurately in the shifter shaft notches and thus prevent side-play. Only this second type lever is being furnished by the Factory Parts Division under Part No. 890567 for both "B" and "C" series transmissions.

When installing this lever in the transmission top cover, the lower end of it must be fitted into the notches in the shifter shafts. An accurate fitting is essential to quiet operation.

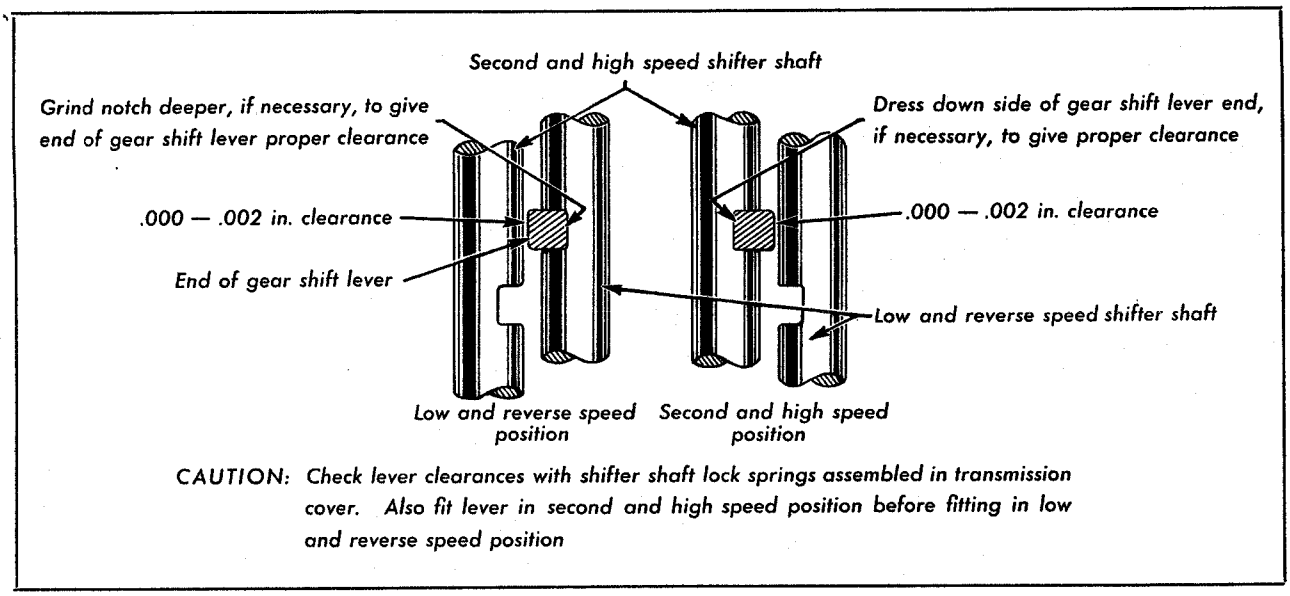
A clearance of .000 to .002 in. must be maintained between the side of the knob of the lever and the second and high speed shifter shaft when in the low and reverse speed position and between the knob and the low and reverse speed shifter shaft when in the second and high speed position. See figure below.

If binding occurs between the low and reverse speed shifter shaft and the lever knob when in the second or high speed position, dress down the side of the gear shift lever knob. If binding occurs at the second and high speed shifter shaft when in the low or reverse speed position, grind the notch deeper in the low and reverse speed shifter shaft.

Care should be taken to avoid removing too much metal when dressing down the lever knob or the shifter shaft. Not more than .002 in. clearance should be allowed.

It is important that these clearances be checked while the lock springs for the shifter shaft are assembled in the transmission cover. Also fit the lever in the second and high speed position before fitting the low and reverse speed position.

Whenever a transmission top cover is removed for the installation of a new transmission control lever, the low and reverse shifter shaft should be inspected to see whether the nut that holds the shifter fork on the shaft is locked by means of a lock washer or a cotter pin. If a lock washer is used, the washer and nut should be removed and a $\frac{1}{2}$ in. x 20 castellated nut, part number 122761, installed. The shaft should be drilled and a cotter pin installed to lock the nut in place. A loose nut at this point may sometimes cause a vibration rattle in the transmission.



CAUTION: *Check lever clearances with shifter shaft lock springs assembled in transmission cover. Also fit lever in second and high speed position before fitting in low and reverse speed position*

Plate 56A. Adjustment of Gear Shift Lever

WHEELS, RIMS and TIRES—Service Information

4. Front Wheel Bearing Adjustment

The procedure to follow in adjusting the front wheel bearings is first to make sure that the wheel is all the way on the spindle. Then tighten the adjusting nut as tight as possible by hand using a wrench with a handle 12 to 15 in. long, after which back off the nut one third turn or two flats. In other words, if the locking device cannot be placed in position without changing the adjustment, tighten instead of loosen the adjusting nut until it can be secured with the locking device. It is preferable to have the adjustment on the tight side rather than the loose side provided it is not necessary to tighten the nut more than ½ the distance to the next cotter pin slot.

It is also a good plan to turn the wheels toward the right side when adjusting the left wheel bearings and toward the left side when adjusting the right wheel bearings to assure full release of the brakes.

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.

5. Removing and Installing Wire Wheel Trim Rings

The removal and installation of the chromium plated trim rings on wire wheels is a simple operation and requires the use of only two special tools which can be made in any service station.

For removing the rings, all that is needed is a screw driver with the blade bent at a 90° angle about two inches from the end, and ground down to a thin flat edge as shown in Fig. 1. By slipping this edge under the ring and prying up at several points, the ring can be easily removed with little or no damage to the finish of the wheel.

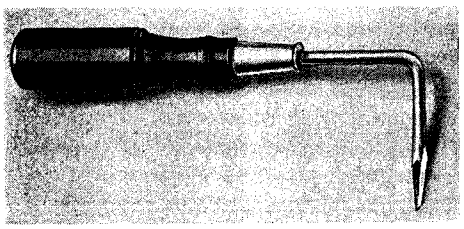


Fig. 1. Bent screwdriver for removing wire wheel trim rings.

A padded block is all that is required for installing the rings. A block of wood about 6 in. x 3 in. x ¾ in. should be shaped at one end to fit the curve of the ring and this end covered with a piece of leather or felt to protect the finish of the wheel. See Fig. 2. The leather or felt should extend high enough along the sides of the block so that there will be no possibility of the wood touching the wheel. Any nails, screws or tacks used to hold the padding should be countersunk to protect the wheel finish.

To install the ring, simply place it in the proper position on the wheel and tap it into place using the block. It should be tapped carefully around the entire circumference to prevent damage. If sufficient care is taken, little or no scratching of the wheel finish should result.

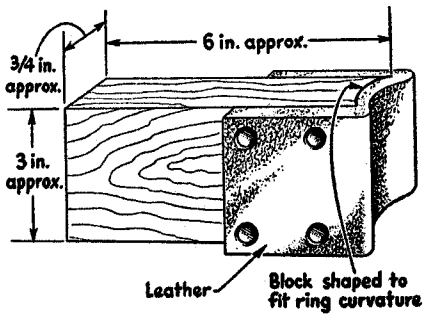


Fig. 2. Padded block for installing wire wheel trim rings.

6. Removing and Installing Large Hub Caps on 452-C

The large hub caps used on 452-C cars are held in place in the same manner as the hub caps used on V-8 and V-12 cars and may be removed and installed in the same way except that the sponge rubber in the disc must be compressed sufficiently to allow the lugs to engage or disengage. To remove, simply turn the hub cap to the left until the catch is felt to release and then pull straight out.

To install the hub cap, place it in such a position that the lugs of the cap fit into corresponding notches in the hub and, pressing the hub cap firmly against the wheel, turn the hub cap its full limit—about one-sixth of a turn to the right.

It is important that the hub cap be pressed firmly against the wheel when installing in order to compress the sponge rubber in the disc enough to permit the hub cap lugs to catch securely. If the hub cap is not securely caught and turned the limit, it may come off and be lost.

Owners should be cautioned to watch filling station attendants who remove the hub caps to inflate the tires, to make sure that the hub caps are correctly installed and firmly caught.

WHEELS, RIMS AND TIRES

General Description

WHEELS AND RIMS

The wheels are of small diameter, the rim diameter being 17 in. on the 345-B, 355-B and 370-B and 18 inches on the 452-B.

Two types of wheels, wire wheels and demountable wood wheels, are furnished. Wire wheels are standard. Disc wheels are not supplied; instead, detachable discs are furnished for installing on the wire wheels to give the appearance of disc wheels. The wood wheels are interchangeable on the same hubs and carriers as the wire wheels.

Drop center rims are used. These rims have a strong section and are free from noises.

TIRES

The tires are of unusually large cross section, especially designed for the drop center rims. The correct pressure for these tires is 40 pounds front and rear. A pressure of 45 pounds should be carried in the front tires on cars driven at high speeds.

Service Information

1. Front Wheel Bearing Adjustment

The ball bearings in the front wheels should not be adjusted too tight. They should be adjusted so that a very slight amount of play or looseness may be discerned. The procedure to follow is first to make sure that the wheel is all the way on. Then turn the adjusting nut up by hand as far as possible and back it off to the second cotter pin slot. In other words, if the locking device cannot be placed in position without changing the adjustment, loosen instead of tighten 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.

2. Mounting Wheels

When mounting the road wheels, it is important that the retaining nuts be drawn up evenly so that the wheel rests squarely on the mounting surface before turning the nuts down tight. If this precaution is not taken the wheels may run out slightly, resulting in wobbling and increased tire wear.

The mounting nuts on the wheel should be drawn up in the same way as those on the demountable rims formerly used, drawing up the nut directly opposite the one last drawn up until all have been drawn up equally. After all the nuts have been drawn up in this manner they should be securely tightened. If this procedure is followed, there should be no run-out.

In mounting the wheels, provision has been made for holding the mounting nuts securely in place by machining both the cones of the nuts and the sockets of the wheel mounting flange to a slightly eliptical shape. Thus, when the nuts are drawn up tightly and the long axis of the nut cone fits the long axis of the socket, the nut is held securely.

When the nut is being drawn up, an increase in resistance will be apparent as the long axis of the nut is across the short axis of the cone. In some cases the resistance may be sufficient to seemingly indicate that the nut is secure. After the opposite nut has been tightened, however, tension may be reduced sufficiently to permit making another half or even full turn of the first nut.

3. Tire and Wheel Balancing

The tires are balanced to offset the weight of the valve stems. If a tire is removed it must be reinstalled in its original position with respect to the rim, otherwise the tire and wheel will be unbalanced. A small red or black dot is accordingly branded in the rubber on the side of each tire. This mark must be placed in line with the valve stem.

Replacement tires procured on the open market are not always balanced to the same degree of accuracy. Therefore, when new tires are installed to replace the original tires on cars used in high-speed service, it is recommended that they be tested for balance and the wheels rebalanced, if necessary, in order to avoid the possibility of tramp or shimmy at high speeds.

This balance can ordinarily be effected by shifting the tire around in relation to the tube so that the valve stem will be at the lighter side of the tire.

In case the wheel itself is out of balance, the wheel must be rebalanced. This may be done as follows:

Remove the wheel from the axle. Remove the felt washers and clean out the grease from the bearing. Mount the wheel upright on a suitable stand (a steering knuckle clamped in a vise will do) and test the wheel by rocking it slowly, allowing it to stop itself. When the wheel stops, the heavier point will be at the bottom. Mark this point and the uppermost point of the wheel; then turn the wheel until these points are in a horizontal position. Add test weights or clay to the light side until the wheel balances in the horizontal position. Remove the clay or test weight and weigh it. Weigh out an equal amount of solder and sweat it on the rim of the wheel, or on the spoke in the case of wire wheels, as near the light point as possible.

When this is accomplished, if the wheel has been balanced with the tire off, the tire must be installed in the proper position to preserve this balance. The wheel bearings should then be repacked with approved wheel bearing grease and the felt washers reinstalled before putting the wheel on the car again.

WHEELS, RIMS AND TIRES

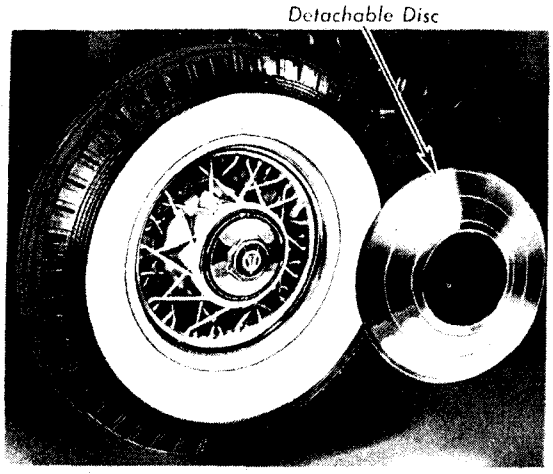


Fig. 1

Detachable Disc for Installation on Wire Wheel to give appearance of Disc Wheel.

Wood Wheels are interchangeable on same hubs and carriers as wire wheels.

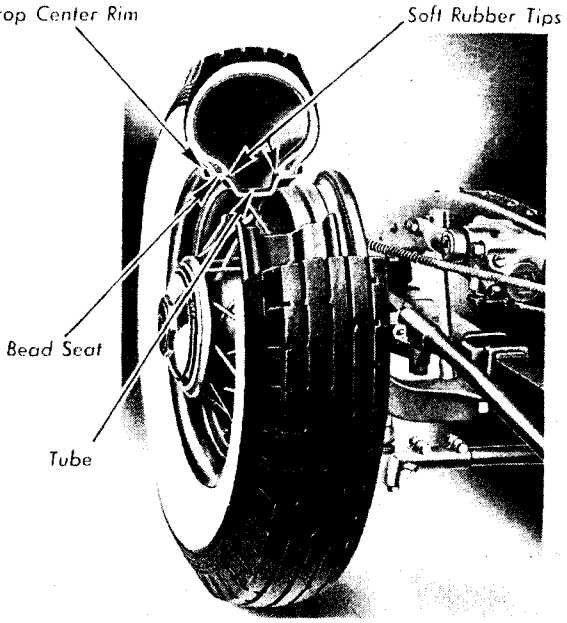


Fig. 2

Sectional View of Tire and Drop Center Rim

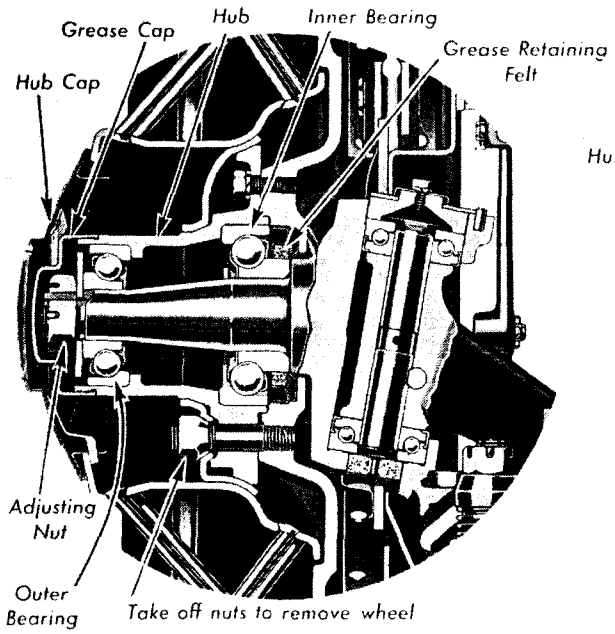


Fig. 3

Typical Front Wheel Hub

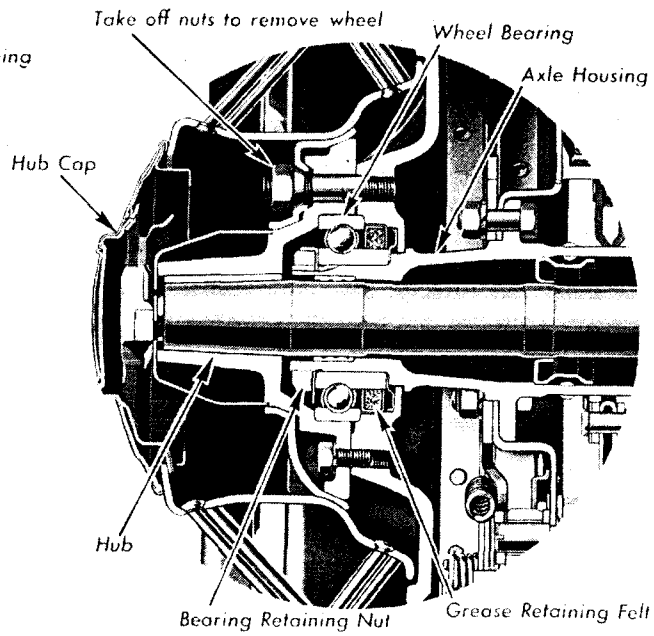


Fig. 4

Typical Rear Wheel Hub

Plate 57. Wheel and Rim Details

WHEELS, RIMS AND TIRES—Specifications

Specifications

Subject and Remarks	LaSalle	Cadillac		
	345-B	355-B	370-B	452-B
Bearings				
Adjustment (See Note 1)	.....	.....	.....	.....
Wheels and Rims				
Brake drum out of round, not over	.005″	.005″	.005″	.005″
Checked with drum mounted on wheel.				
Felloe out of true (radial or lateral run-out), not over	$\frac{1}{32}$″	$\frac{1}{32}$″	$\frac{1}{32}$″	$\frac{1}{32}$″
Mounting Wheels (See Note 2)	.....	.....	.....	.....
Rim				
Type	Drop center	Drop center	Drop center	Drop center
Diameter	17″	17″	17″	18″
Width	4.00″	4.00″	4.19″	4.19″
Tires				
Balancing mark location	.....	.....	.....	.....
Mark on tire should be placed in line with valve stem				
Balancing tires and wheels (See Note 3)	.....	.....	.....	.....
Pressure in pounds—				
Normal				
Front	40	40	40	40
Rear	40	40	40	40
Size	7.00 x 17″	7.00 x 17″	7.50 x 17″	7.50 x 18″

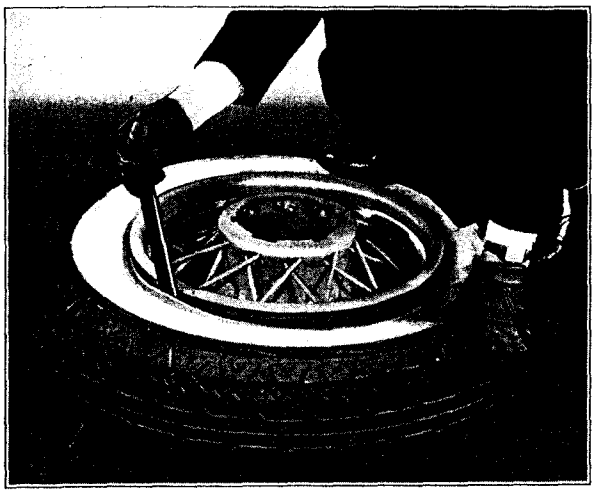


Fig. 1 (Left). Starting the first tire bead over the rim flange

Deflate the tube completely and remove the rim nut on the valve stem. Loosen both beads from the bead seats, using a tire tool if necessary. Stand on the tire, oposite the valve stem, with the feet about 15 in. apart, to force the bead into the rim well.

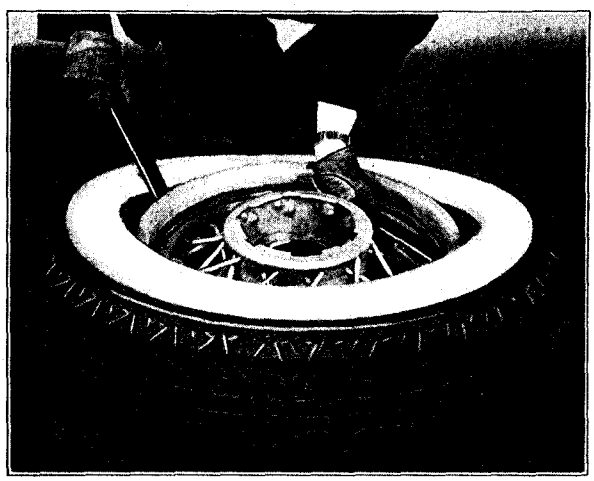


Fig. 2 (Right). Prying short lengths of the first tire bead over the rim flange

Insert two tire tools, about 8 in. apart, between the bead and the rim flange near the valve. Leaving one tool in position, pry short lengths of the bead over the flange with the other until the entire bead has been removed.

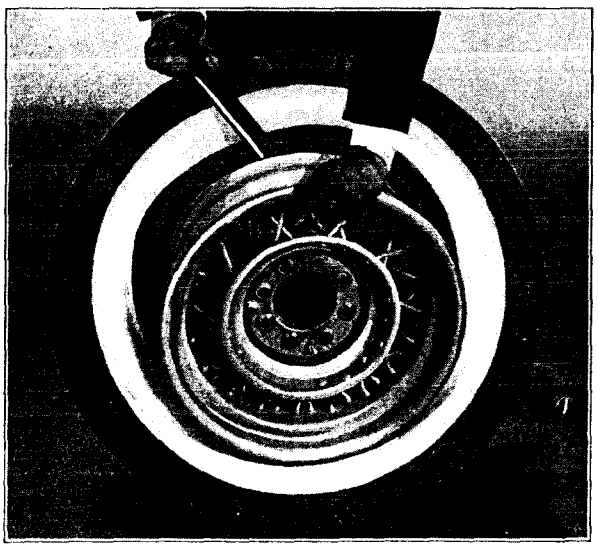


Fig. 3 (Left). Removing the wheel from the second tire bead

Remove the inner tube before attempting to remove the second bead. Raise the wheel to an upright position, insert a tire tool between the second bead and the rim flange at the top side of the wheel and pry the wheel out of the tire. This operation will be simplified if the soft tip of the bead is first coated with vegetable oil soft soap.

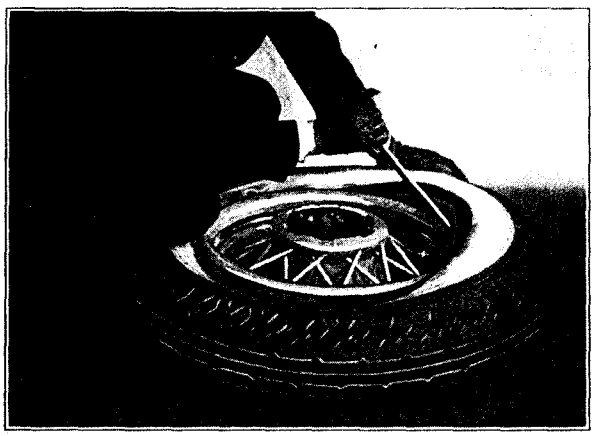
Plate 58. Removing Tire from Drop Center Rim

Fig. 1 (Left). Installing the first tire bead over the rim flange

Coat both beads of the tire with vegetable oil soft soap before reinstalling the tire. Inflate the tube until barely rounded out and insert in the tire with the stem at the tire balancing mark. Place the tire on the rim, guiding the valve through the hole, and apply the rim nut loosely. Push the bottom bead down into the well at the valve and force the remaining portion of the bead over the rim flange, using a tire tool if necessary.

Fig. 2 (Right). Installing the second tire bead over the rim flange

Force the top bead over the rim flange and into the well at the point opposite the valve. Kneeling on this side of the tire to hold it in the well, pry short lengths of the remaining portion of the bead, working around the rim until the entire bead is in place. Always keep as much of the top bead in the well as possible while prying the remainder of the bead.



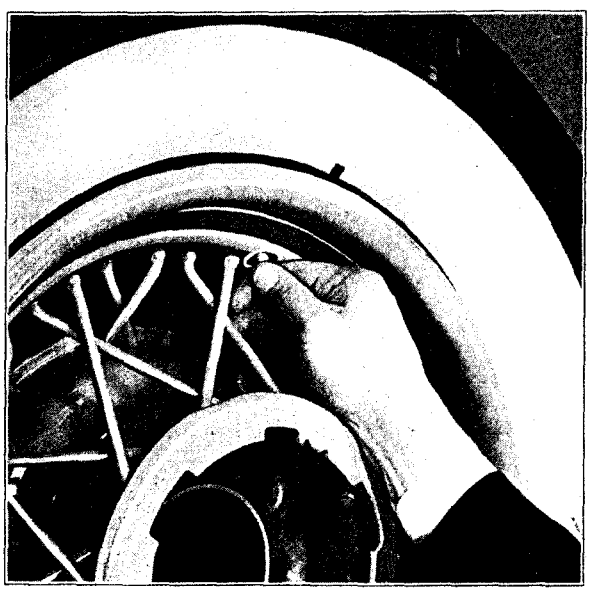


Fig. 3 (Left). Testing tube for pinching

Remove the rim nut and push the valve stem back into the casing as far as possible without letting go of the stem to make certain that the tube is not pinched under the bead; then reapply the rim nut. With the wheel flat on the floor, inflate the tire slowly, making sure that both sides of the tire are centered on the rim.

Plate 59. Installing Tire on Drop Center Rim

Cadillac V-12

Upholstery

Fisher Bodies

39 T 132 - Tan Shadow Pattern Broadcloth

40 T 132 - Brown Diagonal Pattern Broadcloth

41 T 132 - Brown Plain Broadcloth

42 T 132 - Gray Diagonal Pattern Broadcloth

43 T 132 - Gray Plain Broadcloth

44 T 132 - Brown Whipcord

45 T 132 - Green Gray Whipcord

Fleetwood Bodies

Wiese 4305 - Brown Vogue Weave Broadcloth

Wiese 4306 - Taupe Vogue Weave Broadcloth

Wiese 4307 - Gray Vogue Weave Broadcloth

Wiese 4308 - Brown Plain Broadcloth

Wiese 4309 - Taupe Plain Broadcloth

Wiese 4310 - Gray Plain Broadcloth

Wiese 4311 - Tan Arabesque Weave Broadcloth (used with plain headlining to match)

Fisher - Fleetwood Bodies

9 T 1331 - Brown Leather

10 T 1331 - Green Leather

11 T 1331 - Black Leather

12 T 1331 - Blue Gray Leather

Cadillac V-8

Upholstery

Fisher Bodies

28 T 132 - Taupe Plain Mohair

29 T 132 - Gray Whipcord

31 T 132 - Taupe Whipcord

33 T 132 - Taupe Striped Broadcloth

35 T 132 - Taupe Plain Broadcloth

Fleetwood Bodies

Wiese 4305 - Brown Vogue Weave Broadcloth

Wiese 4306 - Taupe Vogue Weave Broadcloth

Wiese 4307 - Gray Vogue Weave Broadcloth

Wiese 4308 - Brown Plain Broadcloth

Wiese 4309 - Taupe Plain Broadcloth

Wiese 4310 - Gray Plain Broadcloth

Wiese 4311 - Tan Arabesque Weave Broadcloth (used with plain headlining to match)

Leather Options for Open Cars and Convertible Coupes

Fisher - Fleetwood Bodies

9 T 1331 - Brown Leather

10 T 1331 - Green Leather

11 T 1331 - Black Leather

12 T 1331 - Blue Gray Leather

CADILLAC V16

Upholstery

Fisher Bodies

39 T 132 - Tan Shadow Pattern Broadcloth

40 T 132 - Brown Diagonal Pattern Broadcloth

41 T 132 - Brown Plain Broadcloth

42 T 132 - Gray Diagonal Pattern Broadcloth

43 T 132 - Gray Plain Broadcloth

44 T 132 - Brown Whipcord

45 T 132 - Green Gray Whipcord

Fleetwood Bodies

Wiese 4305 - Brown Vogue Weave Broadcloth

Wiese 4306 - Taupe Vogue Weave Broadcloth

Wiese 4307 - Gray Vogue Weave Broadcloth

Wiese 4308 - Brown Plain Broadcloth

Wiese 4309 - Taupe Plain Broadcloth

Wiese 4310 - Gray Plain Broadcloth

Wiese 4311 - Tan Arabesque Weave Broadcloth (used with plain headlining to match)

Fisher - Fleetwood Bodies

9 T 1331 - Brown Leather

10 T 1331 - Green Leather

11 T 1331 - Black Leather

12 T 1331 - Blue Gray Leather

Upholstery

Fisher Bodies

28 T 132	-	Taupe Plain Mohair
29 T 132	-	Gray Whipcord
31 T 132	-	Taupe Whipcord
33 T 132	-	Taupe Striped Broadcloth
35 T 132	-	Taupe Plain Broadcloth

Fleetwood Bodies

Wiese 4305	-	Brown Vogue Weave Broadcloth
Wiese 4306	-	Taupe Vogue Weave Broadcloth
Wiese 4307	-	Gray Vogue Weave Broadcloth
Wiese 4308	-	Brown Plain Broadcloth
Wiese 4309	-	Taupe Plain Broadcloth
Wiese 4310	-	Gray Plain Broadcloth
Wiese 4311	-	Tan Arabesque Weave Broadcloth (used with plain headlining to match)

Leather Options for Open Cars and Convertible Coupes

Fisher - Fleetwood Bodies

9 T 1331	-	Brown Leather
10 T 1331	-	Green Leather
11 T 1331	-	Black Leather
12 T 1331	-	Blue Gray Leather

Cadillac V-16, Series 452C

(149-inch Wheelbase)

(BODY BY FLEETWOOD)

Fleetwood Style No.	Type	List Excise Tax to be Added	Delivered
5530-S	5-Pass. Sedan	$6250.00	———
5575-S	7-Pass. Sedan	6400.00	———
5575	7-Pass. Limousine	6600.00	———
5512	Town Cabriolet, Opera Seats	6850.00	———
5525	Town Cabriolet, 7-Pass.	6850.00	———
5591	LimousineBrougham,7-Pass.	6850.00	———

143-inch Wheelbase Chassis 4500.00

149-inch Wheelbase Chassis 4500.00

Tire Size, 7.50—17.

White side wall standard; black optional.

Other Fleetwood Custom Types, built to individual order.

Prices furnished upon request.

List price of Cadillac V-16, Series 452-C, includes either five wheel equipment with spare tire, or 6 wheels, fender wells, two extra tires, and folding trunk rack. Also any color, body or chassis and wide options on upholstery, method of trimming, hardware finish, wood paneling and other appointments.

Accessory Groups

La Salle V-8

Accessory Group No. 1—(for cars with 5 wheels) —Black metal tire cover and protection bar, hinge mirror, moto-pack, cowl ventilator screen	$ 40.00
Accessory Group No. 1A—Same as Group No. 1 with metal tire cover in color to match fender set	42.50
Accessory Group No. 2—(for cars with 6 wheels) —2 black metal tire covers and mirrors, moto-pack, cowl ventilator screen	66.50
Accessory Group No. 2A—Same as Group No. 2 with tire covers in color to match fender set	71.50

Cadillac V-8

Accessory Group No. 3—(for cars with 5 wheels) —Black metal tire cover, hinge mirror, Moto-Pack, cowl ventilator screen	$ 34.50
Accessory Group No. 3A—Same as Group No. 3 with metal tire cover to match fender set	37.00
Accessory Group No. 4—(for cars with 6 wheels) —2 black metal tire covers and mirrors, Moto-Pack, cowl ventilator screen	67.00
Accessory Group No. 4A—Same as Group No. 4 with metal tire covers in color to match fender set	72.00

Cadillac V-12

Accessory Group No. 5—(for cars with 5 wheels) —Black metal tire cover, hinge mirror, moto-pack, cowl ventilator screen	$ 36.50
Accessory Group No. 5A—Same as Group No. 5 with metal tire cover in color to match fender set	39.00
Accessory Group No. 6—(for cars with 6 wheels) —2 black metal tire covers and mirrors, moto-pack, cowl ventilator screen	71.00
Accessory Group No. 6A—Same as Group No. 6 with metal tire covers in color to match fender set	76.00

Accessories

(All prices include installation)

Electric curtain control	$ 13.50
Radio	89.50
Hot air heater (single register)	31.50
Hot air heater (double register)	34.50
Chromium wheel discs	each 9.50
Spot light	37.50
Trunks	$100.00 to 180.00
Robe	45.00

1933 PRICE LIST

◈

La Salle V-8—345-C
Cadillac V-8—355-C
Cadillac V-12—370-C
Cadillac V-16—452-C

January 3, 1933

All prices f. o. b. Detroit
Subject to change without notice

EXCISE TAX TO BE ADDED

CADILLAC MOTOR CAR COMPANY
Detroit, Michigan, U.S.A.

La Salle V-8, Series 345-C

(130-inch Wheelbase)
(BODY BY FISHER)

Style	List Excise Tax	Delivered to be added
5-Passenger Sedan	$2245.00	———
2-Passenger Coupe	2245.00	———
2-Passenger Convertible Coupe	2395.00	———
5-Passenger Town Coupe	2395.00	———

(136-inch Wheelbase)
(BODY BY FISHER)

5-Passenger Town Sedan	$2495.00	———
7-Passenger Sedan	2495.00	———
7-Passenger Imperial	2645.00	———

Standard wheel equipment—5 wire; tire size 7.00—17.
U. S. Royal Black sidewall tires standard equipment.
U. S. Royal White sidewall tires $3.00 extra per tire.

Suggested Minimum Equipment—Factory Installation

For Cars with 5 Wire Wheels

Spare tire and tube (Distributor installation)	$———
Torpedo radiator ornament	20.00
License frames	7.00

For Cars with 6 Wire Wheels

Fender wells, 2 spare wheels and tires and folding trunk rack	$110.00
Torpedo radiator ornament	20.00
License frames	7.00

Group Equipment and Extras

Accessory Group No. 1	$ 40.00
Accessory Group No. 2	66.50
Colored fender set and chassis	25.00
Standard Service Contract	110.00

Cadillac V-8, Series 355-C

(134-inch Wheelbase)
(BODY BY FISHER)

Style	List Excise Tax	Delivered to be Added
2-Passenger Coupe	$2695.00	———
2-Passenger Roadster	2795.00	———
2-Passenger Convertible Coupe	2845.00	———

(140-inch Wheelbase)
(BODY BY FISHER)

5-Passenger Sedan	$2895.00	———
5-Passenger Phaeton	2895.00	———
5-Passenger Coupe	2895.00	———
5-Passenger Town Sedan	2995.00	———
7-Passenger Sedan	3045.00	———
7-Passenger Imperial	3195.00	———
5-Passenger All Weather Phaeton	3395.00	———

(140-inch Wheelbase)
(BODY BY FLEETWOOD)

5-Passenger Sedan	$3295.00	———
7-Passenger Sedan	3445.00	———
7-Passenger Limousine	3645.00	———
5-Passenger Town Cabriolet	3995.00	———
7-Passenger Town Cabriolet	4145.00	———
7-Passenger Limousine Brougham	4145.00	———

Standard wheel equipment—5 wire; tire size 7.00—17.
White side wall tires standard; black side wall optional.

Suggested Minimum Equipment—Factory Installation

For Cars with 5 Wire Wheels

Spare tire and tube (Distributor installation)	$———
Heron radiator ornament	20.00
License frames	7.00

For Cars with 6 Wire Wheels

Fender wells, 2 spare wheels and tires and folding trunk rack	110.00
Heron radiator ornament	20.00
License frames	7.00

Group Equipment and Extras

Accessory Group No. 3	$ 34.50
Accessory Group No. 4	67.00
Colored fender set and chassis	25.00
Standard Service Contract	125.00

Cadillac V-12, Series 370-C

(134-inch Wheelbase)
(BODY BY FISHER)

Style	List Excise Tax	Delivered to be Added
2-Passenger Coupe	$3395.00	———
2-Passenger Roadster	3495.00	———
2-Passenger Convertible Coupe	3545.00	———

(140-inch Wheelbase)
(BODY BY FISHER)

5-Passenger Sedan	$3595.00	———
5-Passenger Phaeton	3595.00	———
5-Passenger Coupe	3595.00	———
5-Passenger Town Sedan	3695.00	———
7-Passenger Sedan	3745.00	———
7-Passenger Imperial	3895.00	———
5-Passenger All Weather Phaeton	4095.00	———

(140-inch Wheelbase)
(BODY BY FLEETWOOD)

5-Passenger Sedan	$3995.00	———
7-Passenger Sedan	4145.00	———
7-Passenger Limousine	4345.00	———
5-Passenger Town Cabriolet	4695.00	———
7-Passenger Town Cabriolet	4845.00	———
7-Passenger Limousine Brougham	4845.00	———

Standard wheel equipment—5 wire; tire size 7.50—17.
White side wall tires standard; black side wall optional.

Suggested Minimum Equipment—Factory Installation

For Cars with 5 Wire Wheels

Spare tire and tube (Distributor installation)	$———
Heron radiator ornament	20.00
License frames	7.00

For Cars with 6 Wire Wheels

Fender wells, 2 spare wheels and tires and folding trunk rack	130.00
Heron radiator ornament	20.00
License frames	7.00

Group Equipment and Extras

Accessory Group No. 5	$ 36.50
Accessory Group No. 6	71.00
Colored fender set and chassis	25.00
Standard Service Contract	160.00

Suggested Auxiliary Equipment for the CADILLAC V-16—SERIES 452C

Part Number		Distributor Cost	Dealer Cost	List Price
A-979 } A-980 }	Metal Tire Covers with Mirrors	$ 27.10	$ 35.80	*$63.00
A-974	License Frames	2.50	3.25	7.00
A-914	Radio Built-in Speaker in Rear Compartment extra.	54.50	64.50	89.50
47276	Fleetwood Robe	27.00	31.50	45.00
885880	Dual Heater	19.75	23.25	34.50
892404	Cowl Ventilator Screen	.55	.70	1.25
	Total	131.40	159.00	240.25

**On colored Metal Covers ducoed to match fendersets add $5.00 net and list.*

Other Exclusive Cadillac Auxiliary Equipment

	Distributor Net Factory Inst.	Dealer Net Factory Inst.	Installed
CADILLAC RADIO	$ 54.50	$ 64.50	$ 89.50
CADILLAC HOT AIR HEATER			
Dual Installation	19.75	23.25	34.50
Single Installation	17.75	21.25	31.50
CADILLAC CUSTOM INSTRUMENT PANELS	10.00	12.00	17.50
CADILLAC WHEEL DISCS			
Per set of six	27.00	36.00	57.00
Per set of five	22.50	30.00	47.50
CADILLAC DUPLEX PILOT RAY LIGHT	28.70	32.65	44.50
CADILLAC LORRAINE LIGHT	20.00	23.50	37.50
CADILLAC FLEETWOOD ROBE	27.00	31.50	45.00
ROBE MONOGRAM	3.50	3.85	5.50
CADILLAC DOUBLE ALPACA ROBE	18.00	21.00	30.00
CADILLAC DOUBLE PLUSH ROBE	16.50	19.25	27.50
CADILLAC METAL COVERED TRUNKS			
A-912 Standard 3 case equipment	$ 56.50	$ 69.50	$107.00
1098279 Standard 4 case equipment	62.50	76.00	119.00
1098280 Standard 3 long case equipment	60.00	73.00	115.00
A-852 Custom Aero Type Luggage Equipment	89.00	111.15	160.00
A-851 Custom Genuine Cowhide Luggage Equipment	101.00	126.10	180.00
85059 Fleetwood 3 case equipment	54.00	66.00	104.00
1098281 Fleetwood 2 long case equipment	52.00	63.50	100.00
CADILLAC TOWN SEDAN AND TOWN COUPE LUGGAGE			
3 Standard Black Cases	20.35	24.05	37.00
CADILLAC OPEN CAR SIDE WINGS	25.00	31.65	47.50

DISTRIBUTORS GROUP EQUIPMENT LIST

La Salle V-8 —Series 345-C
Cadillac V-8 —Series 355-C
Cadillac V-12—Series 370-C
Cadillac V-16—Series 452-C

EXCLUSIVE ACCESSORIES

Issued December 15, 1932

CADILLAC MOTOR CAR COMPANY
Detroit, Michigan, U. S. A.

LaSALLE V-8—SERIES 345C

Five Wheel Equipment

BASIC GROUP

Part Number		Distributor Cost	Dealer Cost	List Price
A-975	Torpedo Ornament	$ 9.50	$12.00	$20.00
A-974	License Frame	2.50	3.25	7.00
	Basic Group Total	$12.00	$15.25	$27.00

GROUP NO. 1

A-877	Metal Tire Cover	7.70	10.10	18.50
891697	Protection Bar	2.90	3.90	6.00
891623	Hinge Mirror	3.60	4.80	8.00
A-945	Moto Pack	3.253.13	4.05	6.25
892404	Cowl Ventilator Screen	.55	.70	1.25
	Group 1 Total	~~$18.00~~ 17.28	$23.55	$40.00
	BASIC AND GROUP 1	$30.00	$38.80	$67.00

On colored fender sets with Metal Tire Cover to match specify Group 1A. Extra charge $2.50 net and list.

BASIC AND GROUP 1A	$32.50	$41.30	$69.50

Six Wheel Equipment

BASIC GROUP

A-975	Torpedo Ornament	$ 9.50	$12.00	$20.00
A-974	License Frames	2.50	3.25	7.00
	Basic Group Total	$12.00	$15.25	$27.00

GROUP NO. 2

A-981-2	Metal Tire Covers with Mirrors	25.30	33.40	59.00
A-945	Moto Pack	3.253.13	4.05	6.25
892404	Cowl Ventilator Screen	.55	.70	1.25
	Group 2 Total	~~$29.10~~ 29.08	$38.15	$66.50
	BASIC AND GROUP 2	$41.10	$53.40	$93.50

On colored fender sets with Metal Covers ducoed to specify Group 2A. Extra charge $5.00 net & list.

BASIC AND GROUP 2A	$46.10	$58.40	$98.50

CADILLAC V-8—SERIES 355C

Five Wheel Equipment

BASIC GROUP

Part Number		Distributor Cost	Dealer Cost	List Price
A-965	Heron Ornament	$ 9.50	$12.00	$20.00
A-974	License Frames	2.50	3.25	7.00
	Basic Group Total	$12.00	$15.25	$27.00

GROUP NO. 3

A-877	Metal Tire Cover, F. & U. S.	7.70	10.10	18.50
A-878	Metal Tire Cover, Goodyear			
891623	Hinge Mirror	3.60	4.80	8.00
A-946	Moto Pack	3.45	4.30	6.75
892404	Cowl Ventilator Screen	.55	.70	1.25
	Group 3 Total	$15.30	$19.90	$34.50
	BASIC AND GROUP 3	$27.30	$35.15	$61.50

On colored fender sets with Metal Tire Cover to match specify Group 3A. Extra charge $2.50 net and list.

BASIC AND GROUP 3A	$29.80	$37.65	$64.00

Six Wheel Equipment

BASIC GROUP

A-965	Heron Ornament	$ 9.50	$12.00	$20.00
A-974	License Frames	2.50	3.25	7.00
	Basic Group Total	$12.00	$15.25	$27.00

GROUP NO. 4

A-981-2	Metal Tire Covers with Mirrors	25.30	33.40	59.00
A-946	Moto Pack	3.45	4.30	6.75
892404	Cowl Ventilator Screen	.55	.70	1.25
	Group 4 Total	$29.30	$38.40	$67.00
	BASIC AND GROUP 4	$41.30	$53.65	$94.00

On colored fender sets with Metal Covers ducoed to match specify Group 4A. Extra charge $5.00 net & list.

BASIC AND GROUP 4A	$46.30	$58.65	$99.00

CADILLAC V-12—SERIES 370C

Five Wheel Equipment

BASIC GROUP

Part Number		Distributor Cost	Dealer Cost	List Price
A-965	Heron Ornament	$ 9.50	$12.00	$20.00
A-974	License Frames	2.50	3.25	7.00
	Basic Group Total	$12.00	$15.25	$27.0

GROUP NO. 5

A-881	Metal Tire Cover, F. & U. S.	8.60	11.30	20.50
A-882	Metal Tire Cover, Goodyear			
891623	Hinge Mirror	3.60	4.80	8.00
A-946	Moto Pack	3.45	4.30	6.75
892404	Cowl Ventilator Screen	.55	.70	1.25
	Group 5 Total	$16.20	$21.10	$36.50
	BASIC AND GROUP 5	$28.20	$36.35	$63.50

On colored fender sets with Metal Tire Cover to match specify Group 5A. Extra charge $2.50 net and list.

BASIC AND GROUP 5A	$30.70	$38.85	$66.00

Six Wheel Equipment

BASIC GROUP

A-965	Heron Ornament	$ 9.50	$12.00	$20.00
A-974	License Frames	2.50	3.25	7.00
	Basic Group Total	$12.00	$15.25	$27.00

GROUP NO. 6

A-979-80	Metal Tire Covers with Mirrors	27.10	35.80	63.00
A-946	Moto Pack	3.45	4.30	6.75
892404	Cowl Ventilator Screen	.55	.70	1.25
	Group 6 Total	$31.10	$40.80	$71.00
	BASIC AND GROUP 6	$43.10	$56.05	$98.00

On colored fender sets with Metal Covers ducoed to match specify Group 6A. Extra charge $5.00 net & list.

BASIC AND GROUP 6A	$48.10	$61.05	$103.00