

# 1930 CADILLAC V-16

*Performance such as the world  
has never witnessed*



*The most highly personalized of all  
motor cars*



**S**IXTEEN-CYLINDER powering, complete individuality in styling—that, in brief, is the story of the Cadillac V-16.

The sixteen-cylinder engine, designed and developed by Cadillac, is wholly new and expresses fully the contemporary conception of brilliant performance. Cadillac-built in every particular, based on the solid, fundamental principles to which Cadillac's unmatched record must be credited, it carries these principles to new heights. It multiplies power and subdivides it into a continuous flow, constantly at full volume efficiency, flexible, and instantly responsive—the ultimate triumph of Cadillac's famous V-type principle.

For this engine, Cadillac has designed a super-chassis, coördinating every unit, so that the full potentialities of power and speed may be enjoyed as never before.

The bodies are of many types, custom-built and elaborately finished, and all highly individualized.

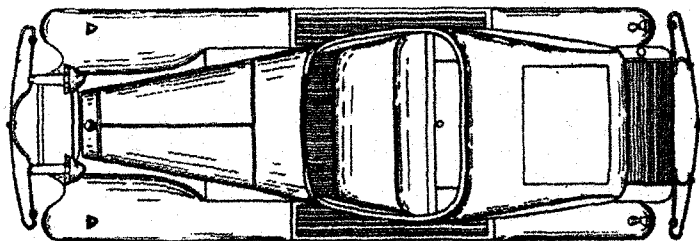
Personal preferences in styling and colors can be fully expressed. The finish of panels, upholstery fabrics, trim, and other factors of style and beauty may be blended into distinctive expressions of individuality.

Even major features of styling can be adapted to the individual taste. Cadillac, having priority use of the facilities of the Fleetwood Body Corporation, is the only car builder who can produce custom cars as complete units under a single manufacturing supervision.

*The drawings in this portfolio are designer's  
scale drawings of custom-body types for the  
Cadillac V-16 chassis*

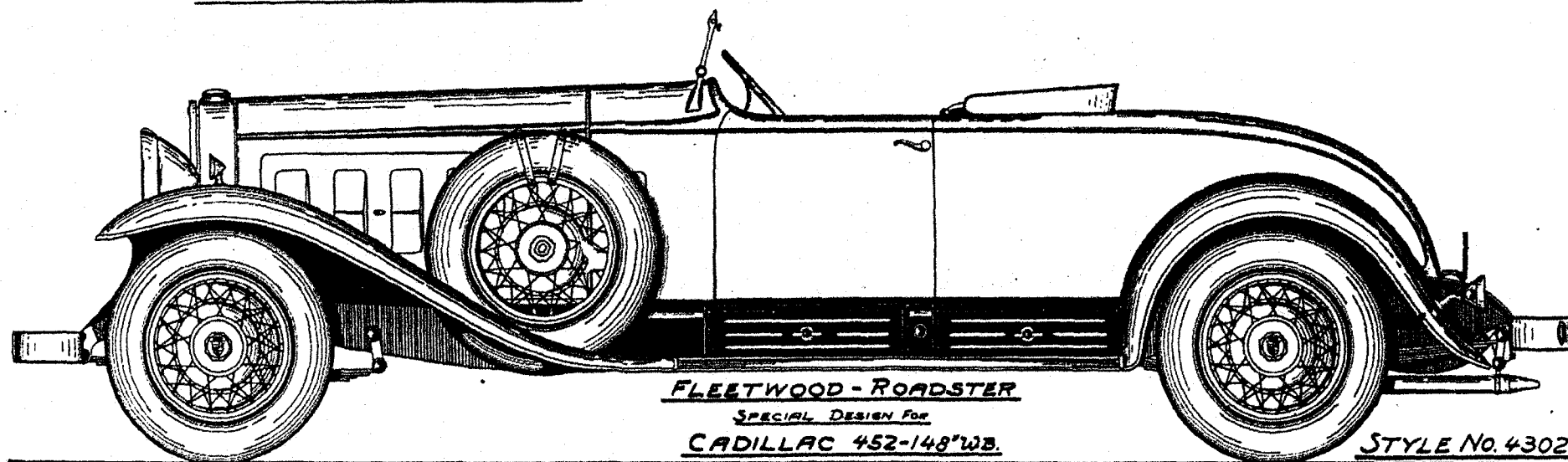
CADILLAC MOTOR CAR COMPANY





FLEETWOOD BODY CORPORATION

FLEETWOOD NEW YORK DETROIT



FLEETWOOD - ROADSTER

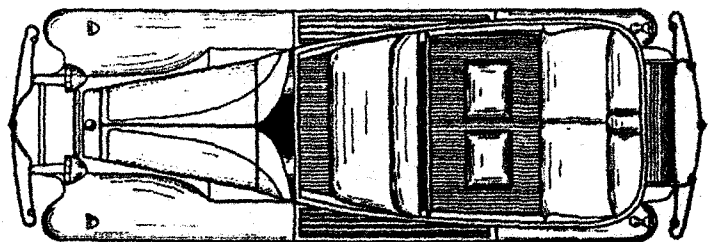
SPECIAL DESIGN FOR

CADILLAC 452-148"WB.

STYLE No. 4302

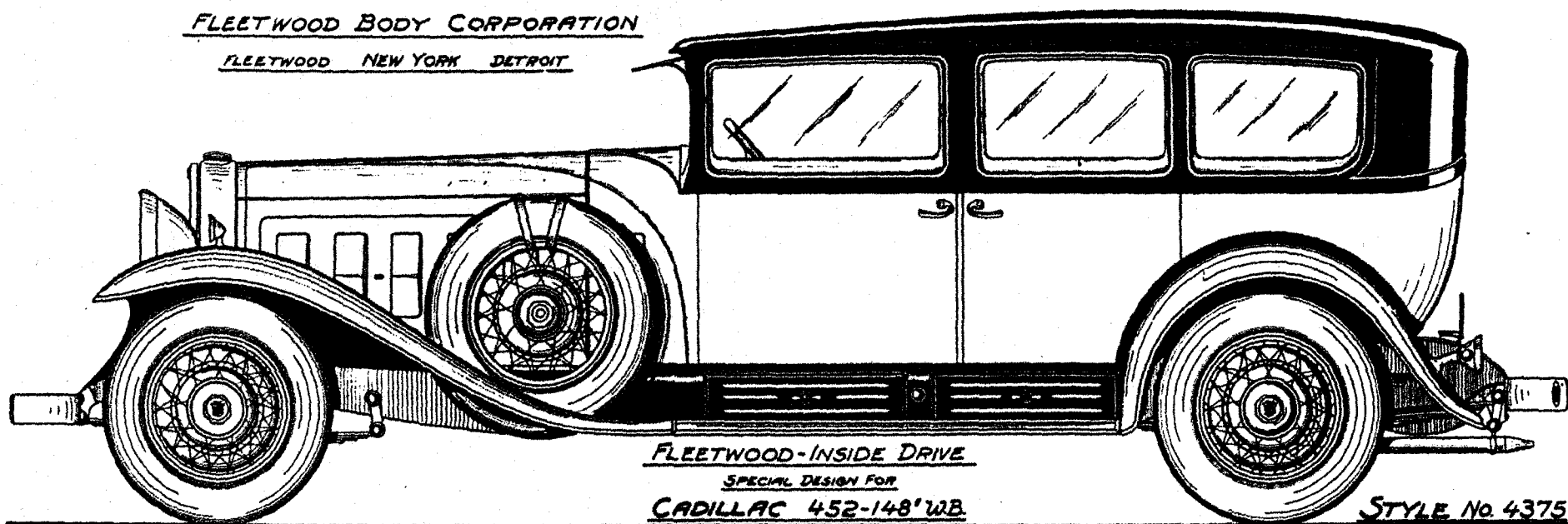
DESIGN COPYRIGHTED

1930 Fleetwood - Roadster - Style No. 4302



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FLEETWOOD NEW YORK DETROIT



FLEETWOOD-INSIDE DRIVE

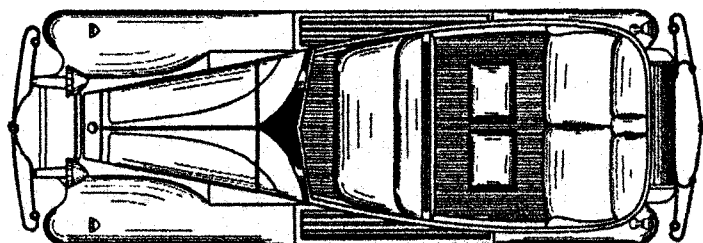
SPECIAL DESIGN FOR

CADILLAC 452-148"WB

STYLE No. 4375

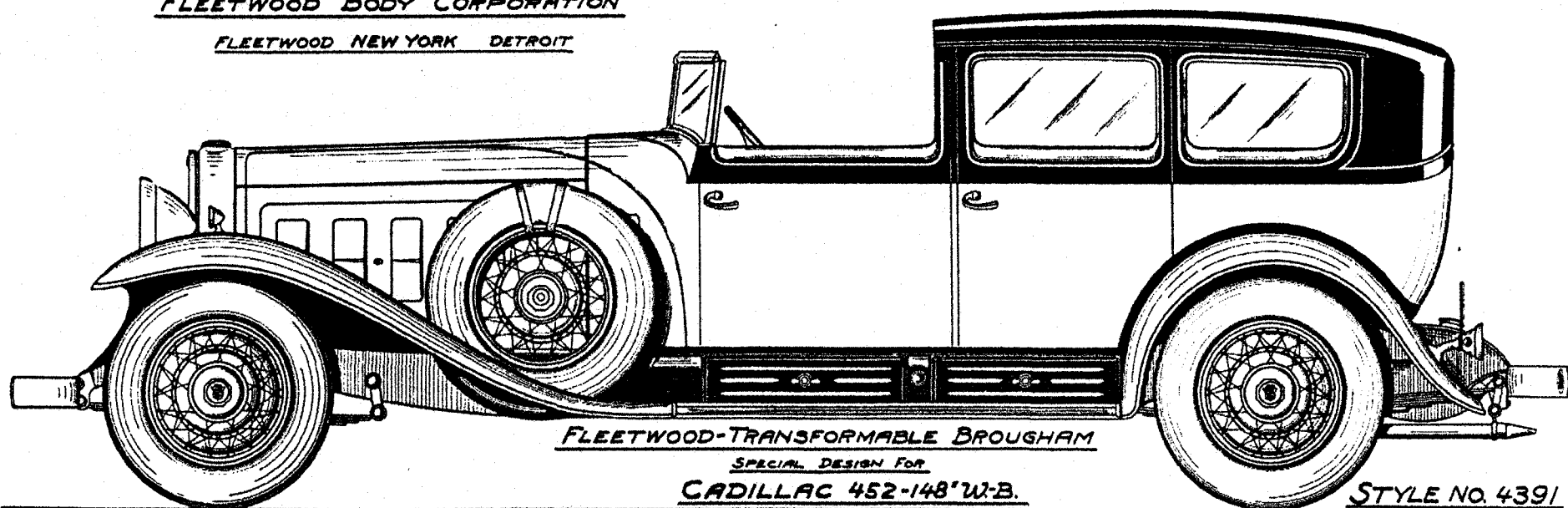
DESIGN COPYRIGHTED

1930 Fleetwood - Inside Drive - Style No. 4375



FLEETWOOD BODY CORPORATION

FLEETWOOD NEW YORK DETROIT



FLEETWOOD-TRANSFORMABLE BROUGHAM

SPECIAL DESIGN FOR

CADILLAC 452-148" W.B.

STYLE NO. 4391

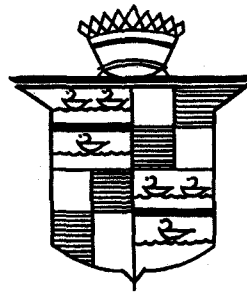
DESIGN COPYRIGHTED

1930 Fleetwood - Transformable Brougham - Style No. 4391

*Multi-cylinder Performance*  

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*proves itself one of the most*  
*fundamental of Cadillac's many*  
*contributions to motoring luxury*



# *A new principle in fine car motoring*

REPEATEDLY during the past thirty years, Cadillac has pioneered momentous improvements in automotive engineering + + Every one of these has meant increased luxury in motoring—greater convenience, more dependable performance, improved handling ease, freedom from continual adjustments, more complete comfort. Always, they have helped to make motoring more satisfying, more thoroughly delightful + + Most of them have been widely adopted throughout the industry. Many of them are now standard features in all price classes + + And now Cadillac has presented multi-cylinder performance—a new principle in fine-car motoring + + This new principle—first made available to motorists with the Cadillac V-16, and now offered in both the V-16 and V-12—adds qualities of smoothness, silence, and easy speed that greatly increase the luxury of motoring; and that no conventional engine type can possibly attain + + The brilliant success already

achieved by the Cadillac V-16 and V-12 is directly attributable to this triumphant principle. For here is a fundamentally new kind of motoring—performance more distinguished and more truly elegant than motor car travel has ever been before + + As one who prizes the finest things, you will certainly want to examine Cadillac's multi-cylinder cars without further delay + + They embody now, in its finest interpretation, the engineering principle toward which future progress throughout the industry will assuredly trend. They are richly styled and appointed in full harmony with their advanced mechanical excellence. They inaugurate a new era in fine-car motoring.

*Pictured on the following pages are several distinguished body types in which the Cadillac V-12 and V-16 are available. All prices quoted are f. o. b. Detroit and are for standard equipment.*

# *The Cadillac V-12*

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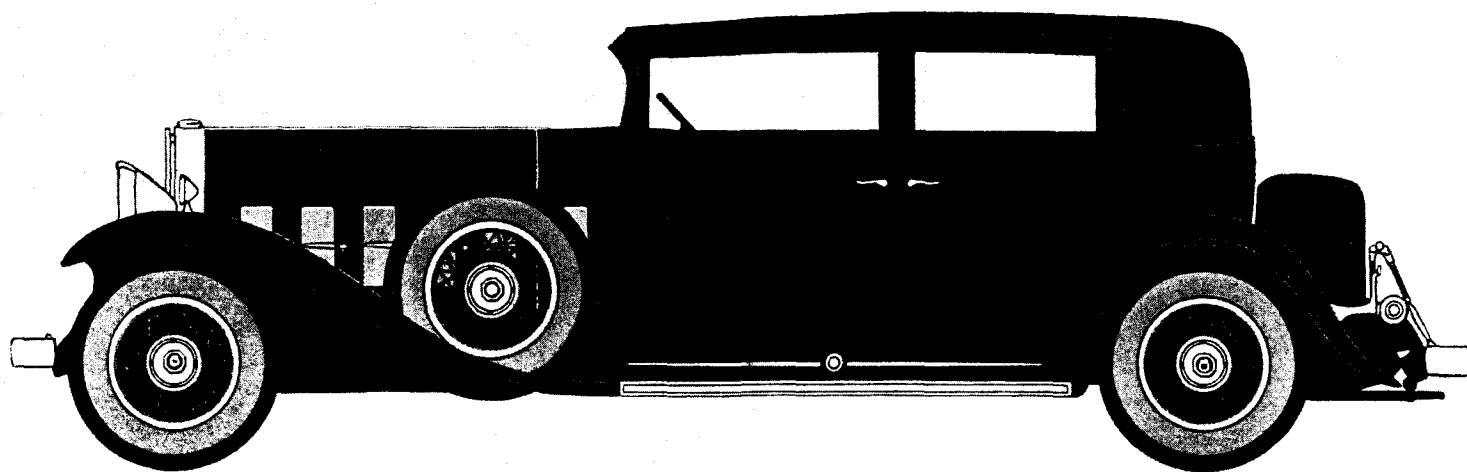
MODERN DESIGN, as evidenced in the Cadillac V-12 and V-16, is strong assurance of enduring value in a motor car. Undoubtedly, the fine-car power plant of the future is the multi-cylinder engine. The Cadillac V-12 and V-16, therefore, are the wisest motor car investments on the market today. Not only are they solidly built to familiar Cadillac standards in every part, but also they are powered by multi-cylinder engines—the engine type of the future—for really distinctive performance and for sustained value.

IN COACHCRAFT, no less than in mechanical excellence, the Cadillac V-12 and V-16 are notable for genuine distinction. Motordom has paid outspoken tribute to their beauty. They are long and graceful in line, rich in finish and appointment, and highly personalized. All body types of the V-16 are designed and produced by Fleetwood—individually built in a truly custom atmosphere by master creators of motor car fashions. All interiors of the V-12 are also done in the Fleetwood shops, whether Fisher or Fleetwood fashioned the bodies.

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A line of richly beautiful motor cars which, foremost in their price range, supply the remarkable performance characteristics of a multi-cylinder engine—the one new thing in motoring.

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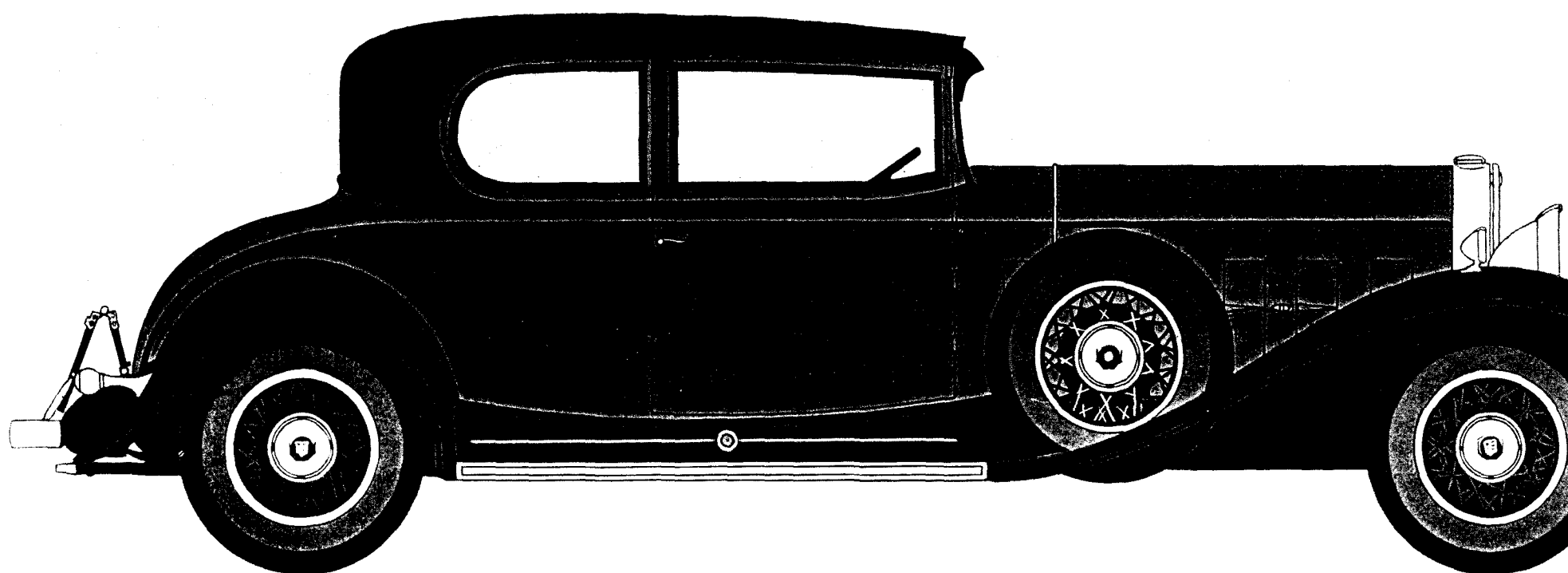
CADILLAC V-12, *Five-passenger Town Sedan*, \$3945

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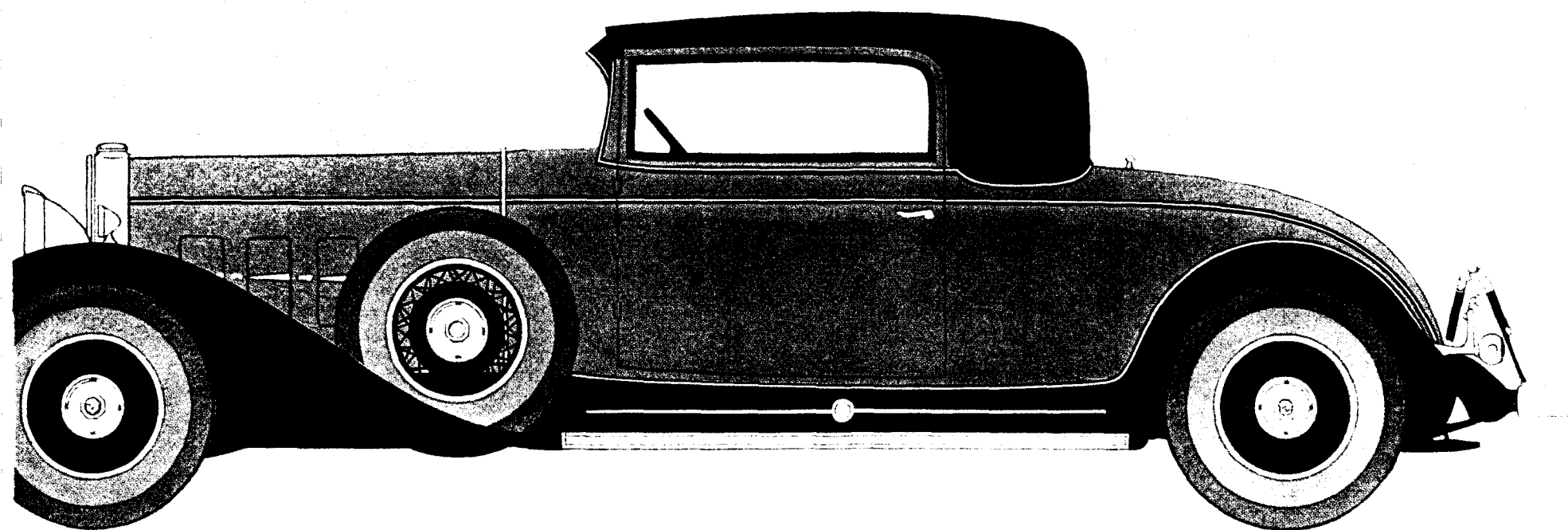


*Cadillac V-12*



CADILLAC V-12, *Five-passenger Coupe*, \$3895

*Cadillac V-12*



CADILLAC V-12, *Two-passenger Coupe*, \$3795

# *The Cadillac V-16*

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ALL of the distinctive engineering features for which Cadillac is world-famous are retained in the Cadillac V-12 and V-16 to assure complete luxury in transportation. These cars have the Syncro-Mesh transmission, fully harmonized steering, safety-mechanical brakes, all in their highest development. The braking system is especially powerful. Since these cars easily attain and maintain unusually high rates of speed, their braking efficiency is supplemented at high speeds by a vacuum assister which automatically multiplies the pressure on the pedal.

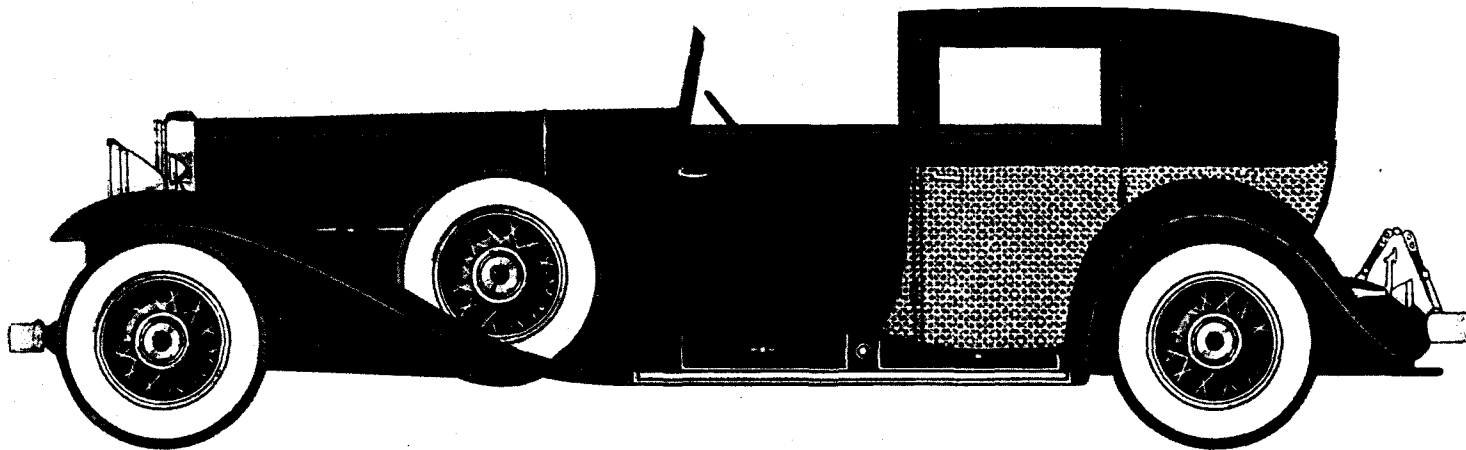
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NOTHING can contribute more to your enjoyment of a motor car month by month than expert and courteous attention to its maintenance needs. In the case of the Cadillac V-12 and V-16 this attention is given systematically by an organization which has specialized for a generation in fine-car service exclusively. Cadillac service is already world-famous for liberal policies and painstaking workmanship. And today, it is more fully organized than ever for the convenience and satisfaction of Cadillac owners. The Cadillac Standard Service Contract, particularly, is a happy way of settling the whole matter of service in advance.

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Motordom's finest achievement in beauty, luxury, and brilliant performance. This is the most highly personalized of all motor cars—a car unmatched in every aspect of fine motoring.

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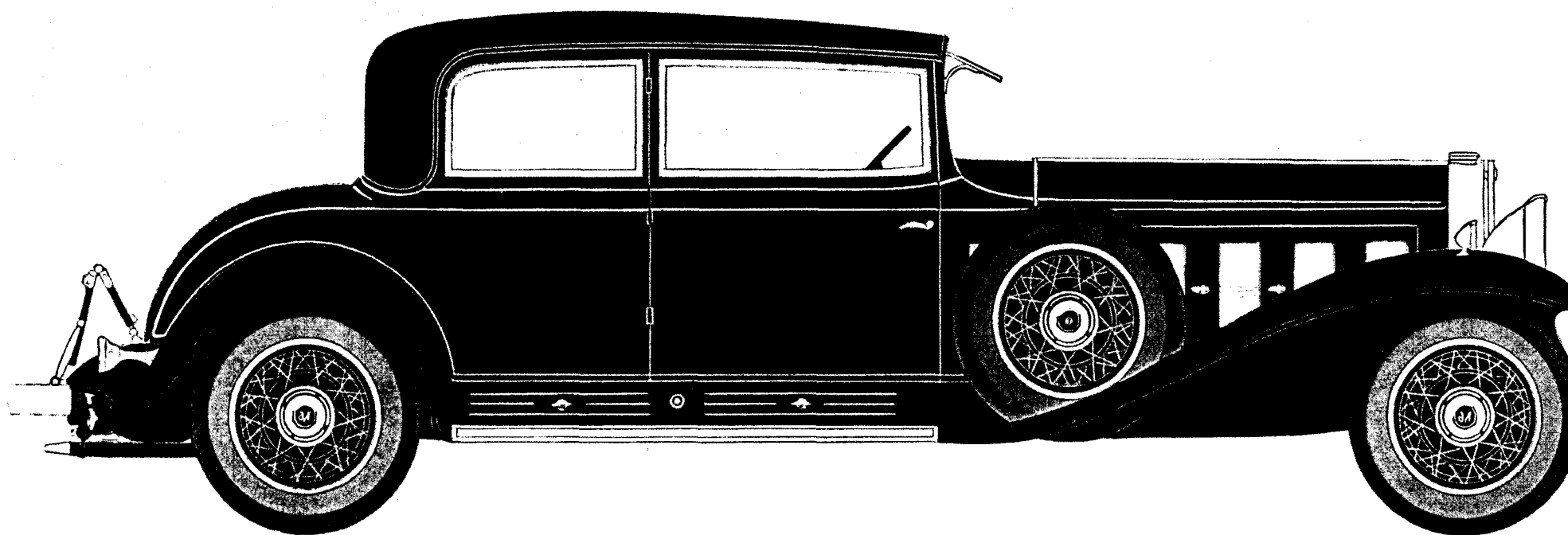


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CADILLAC V-16, STYLE No. 4264B, *Town Brougham*, \$9700

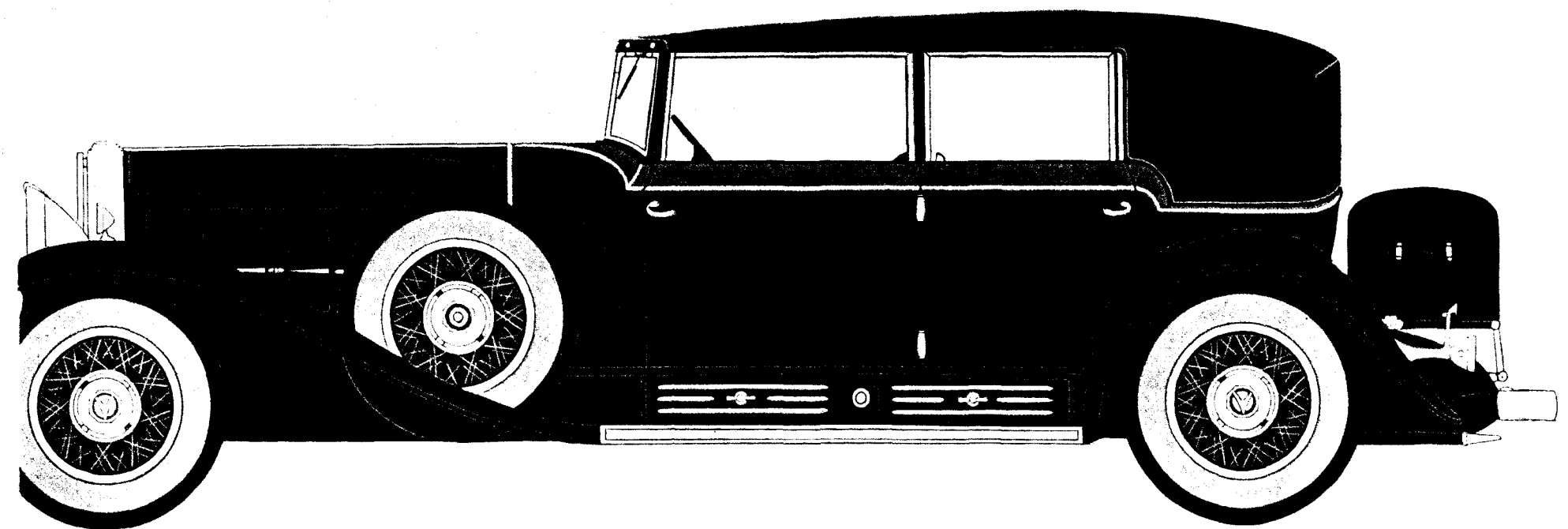


*Cadillac V-16*



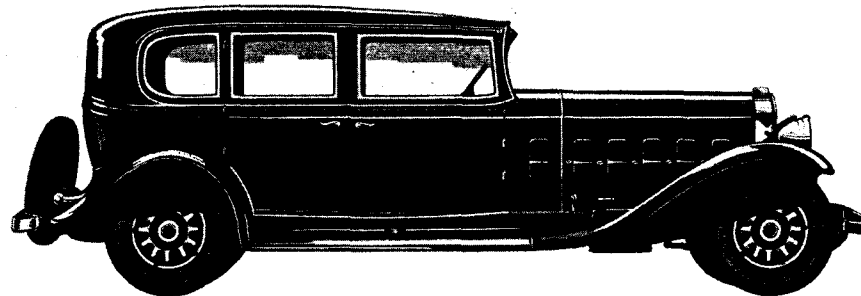
CADILLAC V-16, STYLE NO. 4381, *Five-passenger Coupe*, \$5950

*Cadillac V-16*

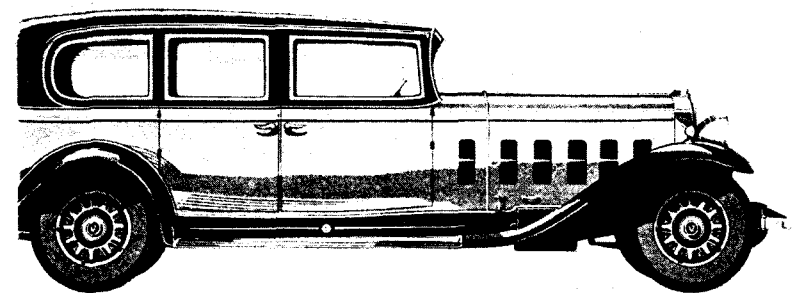


CADILLAC V-16, STYLE NO. 4380, *All-Weather Phaeton*, \$5750

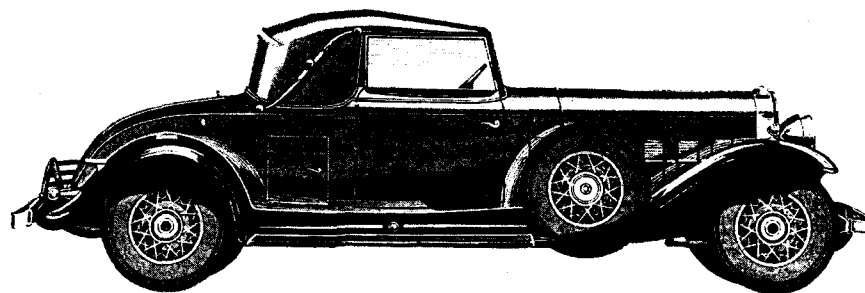
THE prospective purchaser of a Cadillac V-12 or V-16 does not find his choice confined to a few standard models or a limited number of conventional colors. For the Cadillac V-12 is available in eleven distinctive body styles—the Cadillac V-16 in thirty-one. Individual custom creations, specially built, can also be obtained for the V-16 chassis. In addition, Cadillac offers in the V-12 and the V-16 an amazingly wide range of color combinations to the buyer who wishes to gratify his individual preferences + + Illustrated on the opposite page are seven more body styles that Fleetwood and Fisher Body artists have created for the Cadillac V-12. Whichever style you select, the charm of its authoritative styling will prove quite matchless in combination with Cadillac's luxurious comfort and spirited performance.



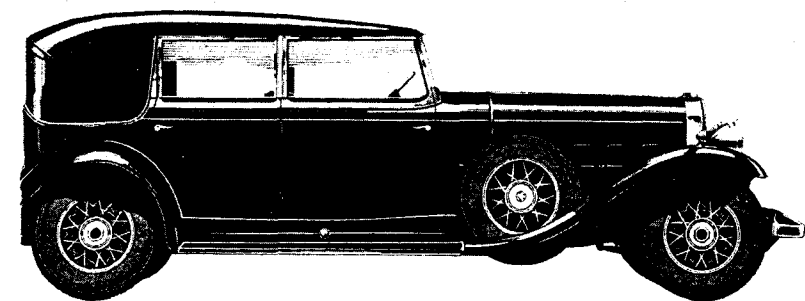
CADILLAC V-12, *Five-passenger Sedan*, \$3895



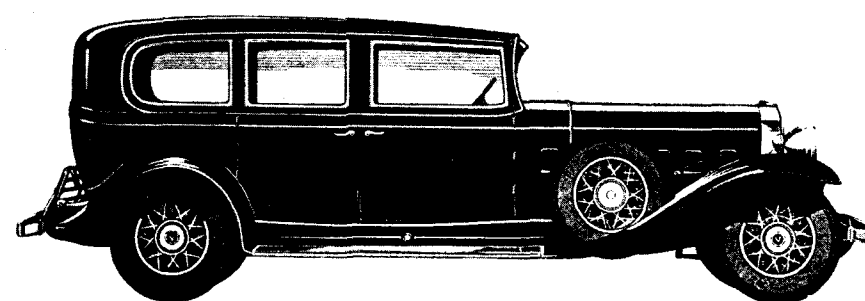
CADILLAC V-12, *Seven-passenger Sedan*, \$4195



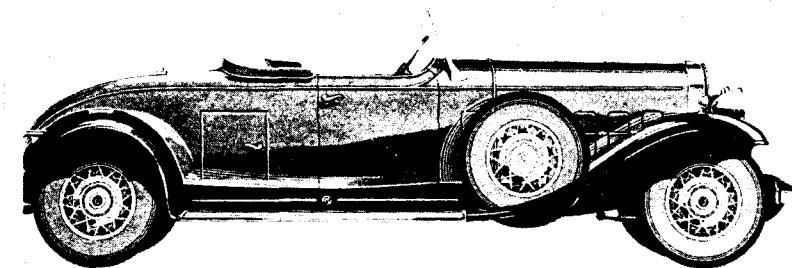
CADILLAC V-12, *Two-passenger Convertible Coupe*, \$4045



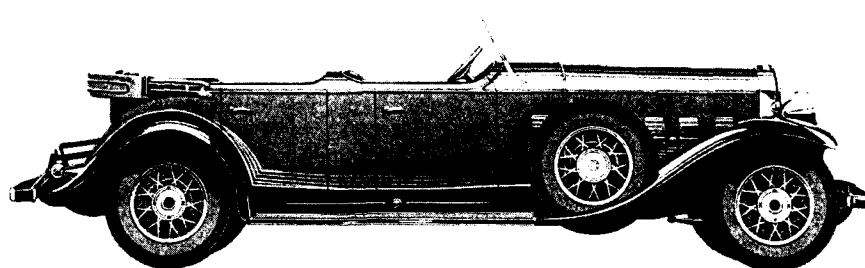
CADILLAC V-12, *Five-passenger All-Weather Phaeton*, \$4895



CADILLAC V-12, *Seven-passenger Imperial*, \$4345

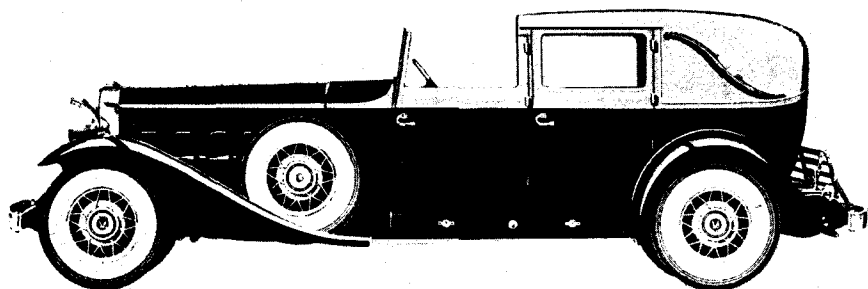


CADILLAC V-12, *Two-passenger Roadster*, \$3945

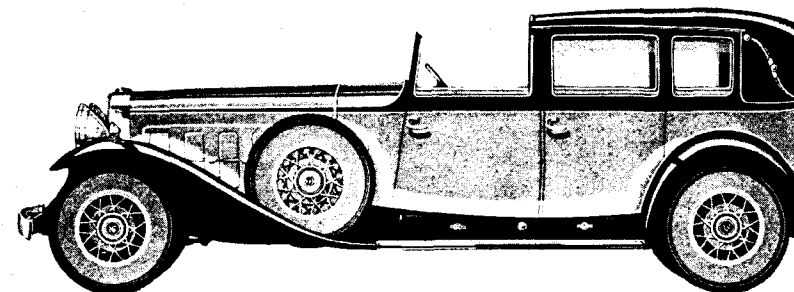


CADILLAC V-12, *Five-passenger Phaeton*, \$4045

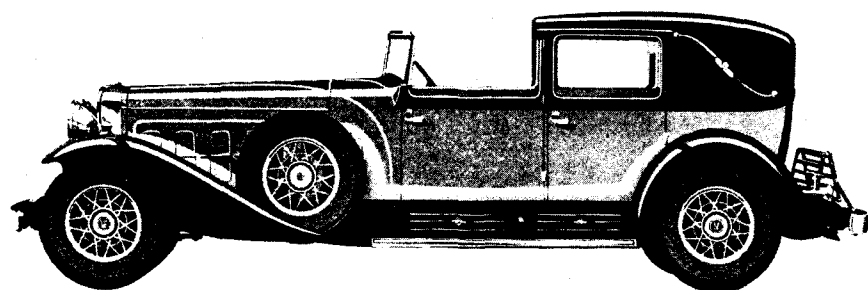




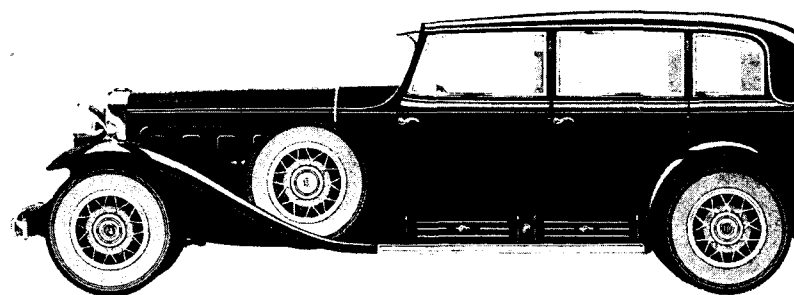
CADILLAC V-16, STYLE NO. 4225, *Town Cabriolet*, \$8750



CADILLAC V-16, STYLE NO. 4220, *Town Cabriolet*, \$8750

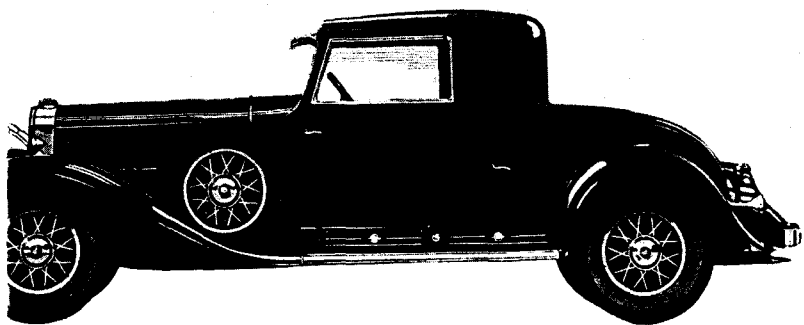


CADILLAC V-16, STYLE NO. 4312, *Town Cabriolet*, \$6525

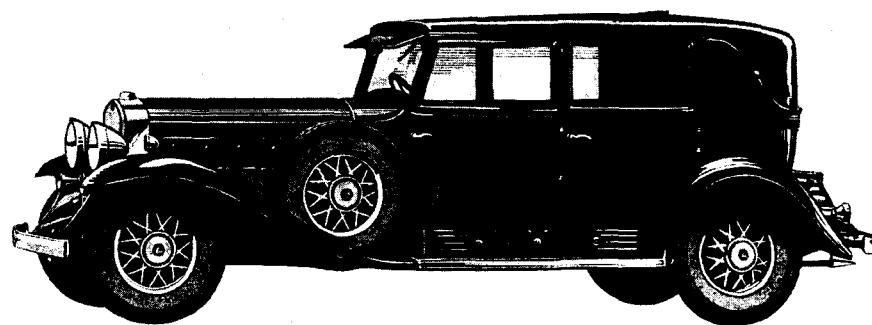


CADILLAC V-16, STYLE NO. 4130, *Five-passenger Imperial* \$7300

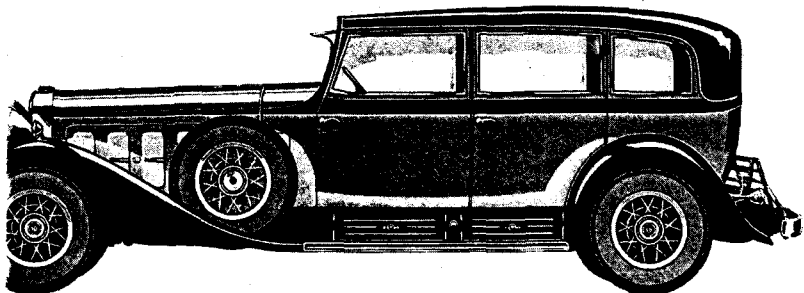
THE Master Craftsmanship of Fleetwood—perhaps the most famous name in custom body circles—is found in every one of the Cadillac V-16 body styles. Thus, in selecting the body style that suits your requirements, you are certain of obtaining a custom creation that is appropriate to the mechanical perfection of the V-16 chassis.



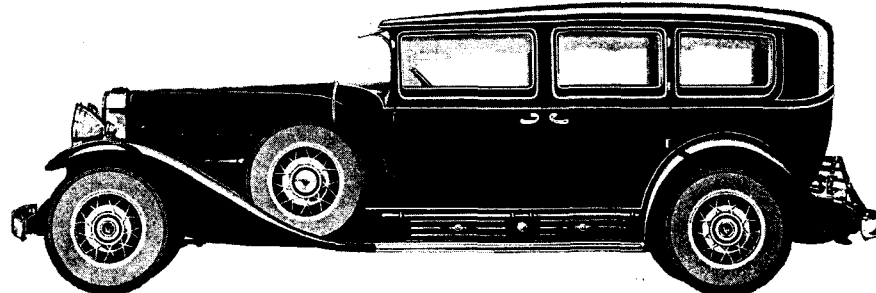
CADILLAC V-16, STYLE No. 4476, *Two-passenger Coupe*, \$5800



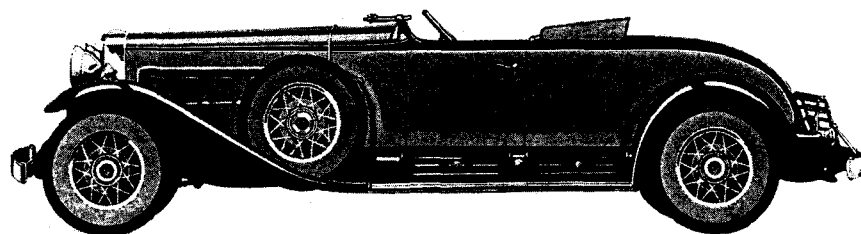
CADILLAC V-16, STYLE No. 4155-S, *Five-passenger Sedan Cabriolet*, \$7125



CADILLAC V-16, STYLE No. 4175, *Seven-passenger Imperial*, \$7525

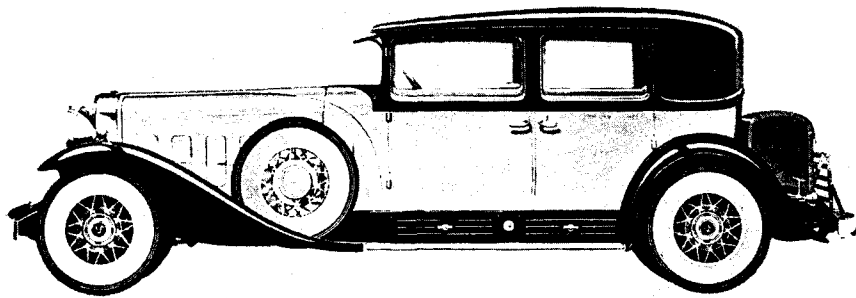


CADILLAC V-16, STYLE No. 4375, *Seven-passenger Imperial*, \$6525

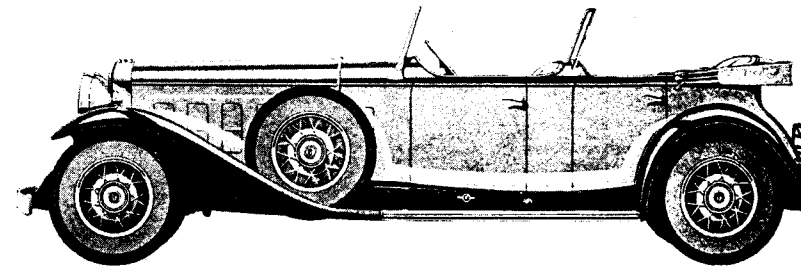


CADILLAC V-16, STYLE No. 4302, *Two-passenger Roadster*, \$5350

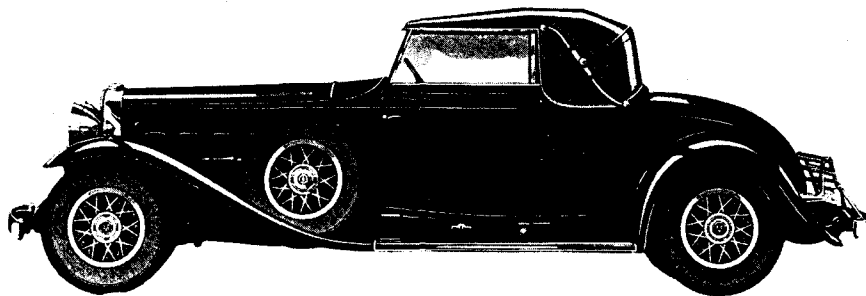
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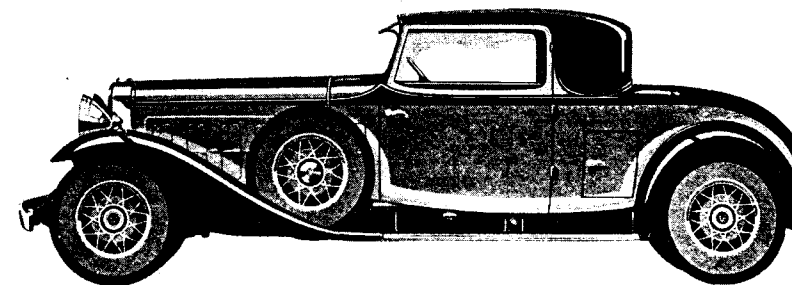
CADILLAC V-16, STYLE No. 4361-S, *Five-passenger Club Sedan*, \$5950



CADILLAC V-16, STYLE No. 4260, *Five-passenger Phaeton*, \$6500

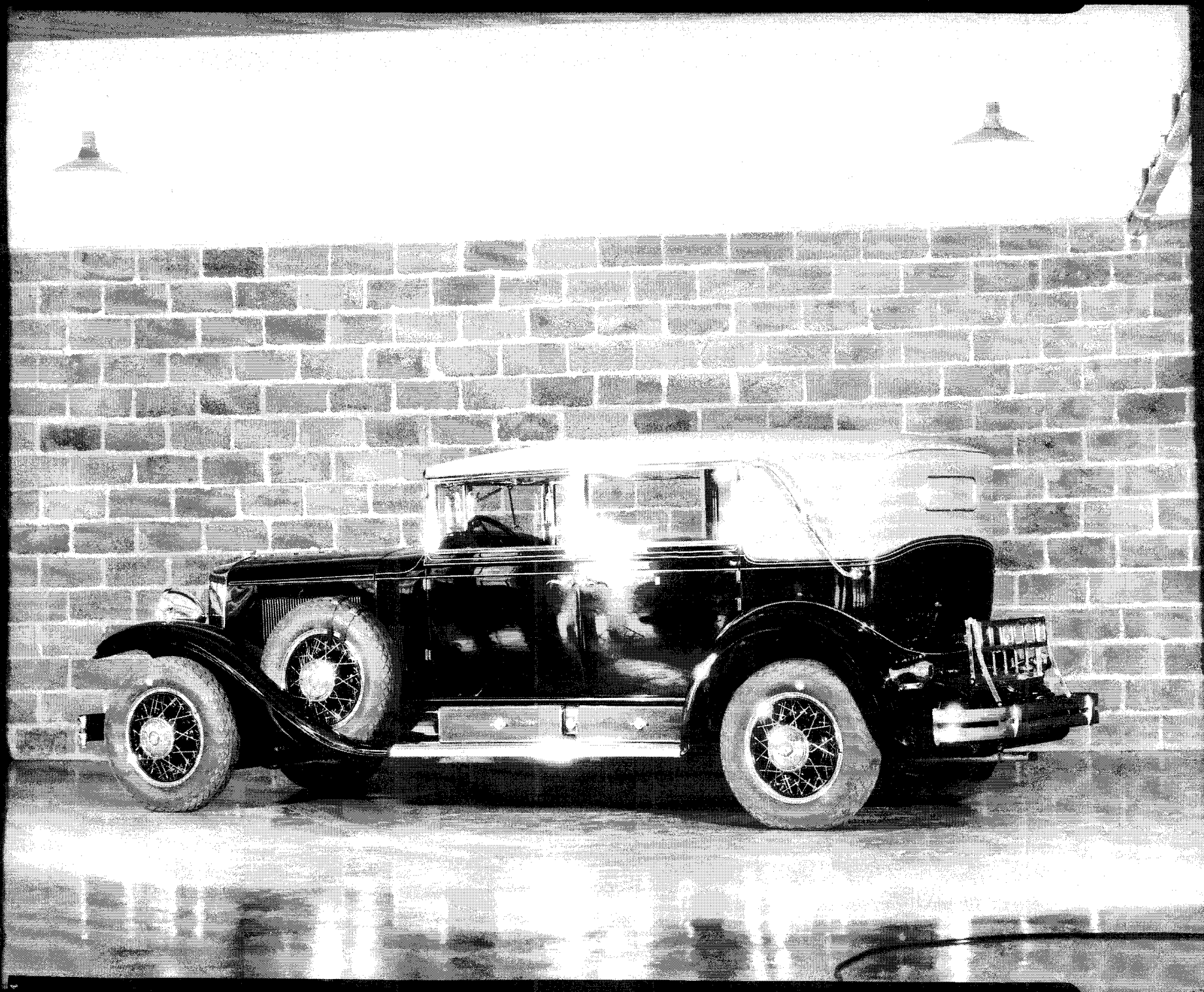


CADILLAC V-16, STYLE No. 4235, *Two-passenger Convertible Coupe*, \$6900



CADILLAC V-16, STYLE No. 4276, *Two-passenger Coupe*, \$6850







Cadillac  
Standard  
of the World

# Call Me Madame, Madame-X, That Is!

**T**hey called her Madame-X. She was sleek, smooth, exquisitely stylish, and a very eXciting show stopper! Madame-X made her exciting public debut in 1930, sparkling brightly in the glow of brilliant lights at the 1930 New York Automobile Show. She was an unusual and special Cadillac V-16.

Ironically, the first Madame-X, however, was not a Cadillac, but rather a LaSalle which also had been designed by the famous Harley Earl, head of GM's young automotive Design-Art-and-Color Section.

Earl had a strong desire to build a unique, special body design in that then new era of 1929, and with the blessing of Larry Fisher (of Fisher Body) and with a new LaSalle chassis, Earl set about to create his passionate task. The result was a sleek low-slung, four-door model with the chassis dropped nearly five inches and a special roof design featuring ultra thin pillars.

By James Wren



Cadillac Motor Car Co. Detroit, Mich.



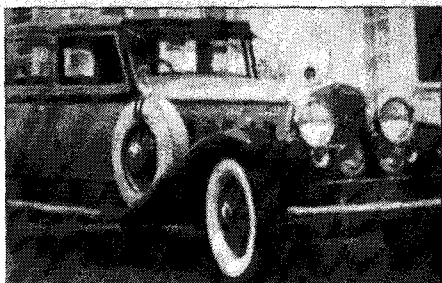
The powers-that-be at Fisher Body, however, took one look at those ultra-thin wooden pillars and gave an instant no, citing safety concerns, especially in a car designed for Larry Fisher. Earl quickly solved the problem, however, with specially-milled thin but very strong steel pillars. Although Larry Fisher drove the car for only a few years, the roof treatment was an immediate success as it caught-on in a big way. Thus, later when the Cadillac V-16 was being designed, the unique and now-popular roof and pillar treatment were included.

When asked what the designation of the unusual styling should be called, Earl stated, "Just call it Madame-X." Harley had recently seen the popular actress Pauline Fredericks star in a theater stage play near the General Motors building. Her play was called Madame-X. Greatly impressed by her superb and splendid drama, when the Cadillac V-16 debuted with Earl's new styling, the strange new name went with it.

The Cadillac V-16 Madame-X including Earl's steel-pillar treatment received an additional touch with a flat windshield which was sharply raked or slanted. The slant had been dramatically changed from a mild seven degrees to a severe eighteen degrees.

The slanting windshield was even greater than that of the Cadillac roadster and a true eye-stopper. Further complementing the novel, startling windshield treatment were windows whose edges were chrome trimmed.

Adding to the sleek, long, relaxing look, a horizontal belt molding extended from the radiator alongside the plain



Madame X

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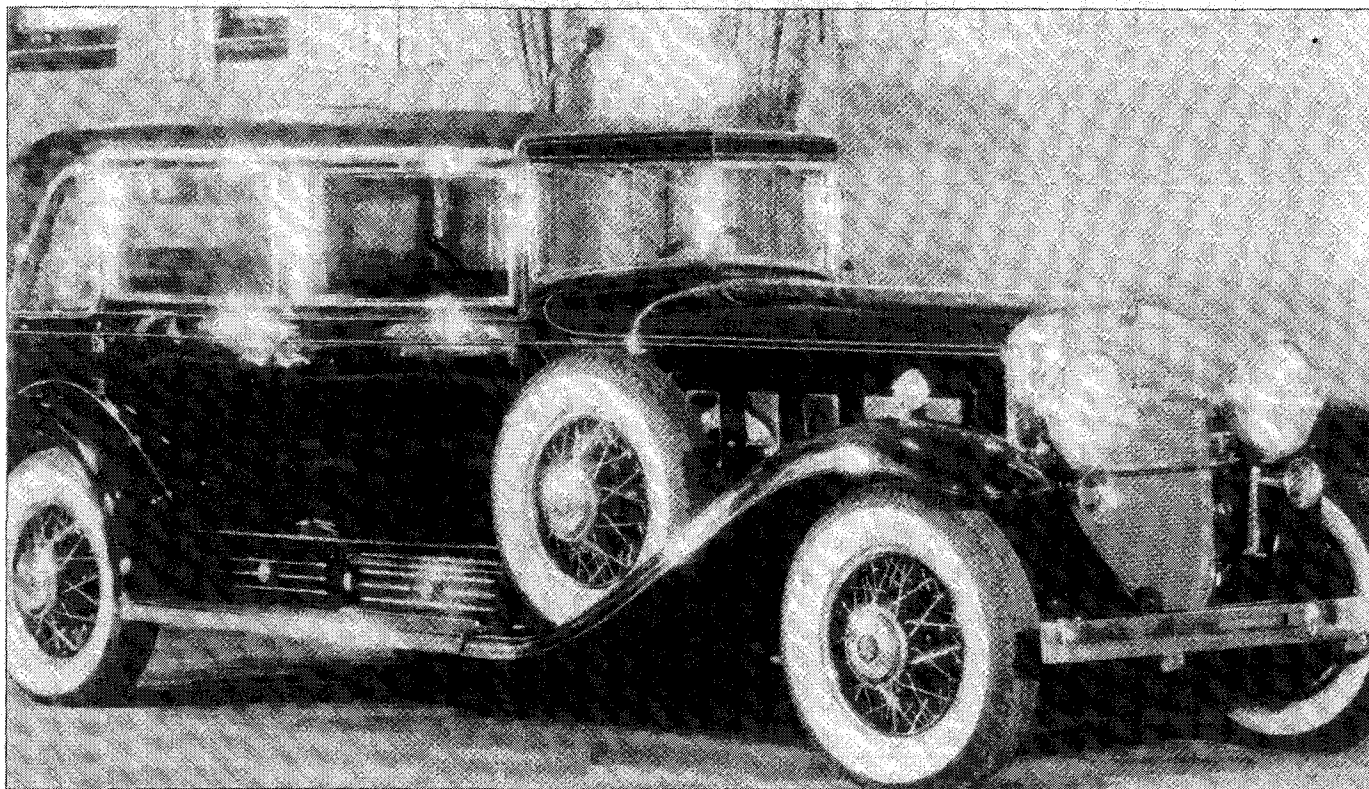


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The Madame-X in 1930 at the New York Auto Show.

One of the most unusual names graced  
a series of dramatic Cadillac V-16 models

The Cadillac V-16  
Madame-X including  
Earl's steel-pillar treat-  
ment received an  
additional touch with  
a flat windshield  
which was sharply  
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eighteen degrees

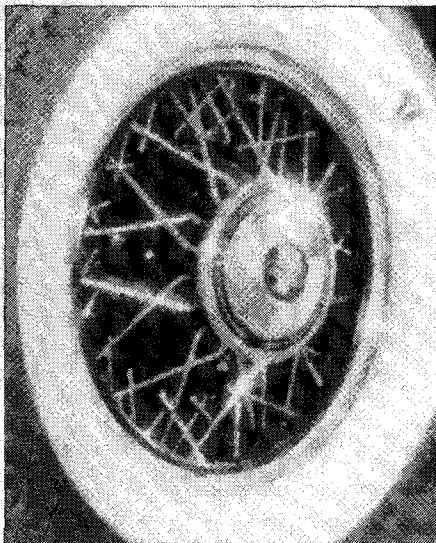
hood towards the rear. On several suc-  
cessful earlier models, the molding had  
been of stainless steel.

Stainless steel-spoked-wire wheels  
with snap-on, stainless-steel caps also  
added to the Madame's sparkling make  
up. A single bar, chrome bumper,  
chromed trumpet-styled horns on each

side of a chromed screen which covered  
the tall grill added to the glamorous  
exterior. Also featured were huge,  
bright, bowl-type head lights with a  
concave tie-bar between, sported a  
sparkling "V-16" medallion. Five  
chrome louvered doors on the side of  
the hood also added a distinctive touch.

The beauty did not end with exterior  
trim alone, however, as the engine com-  
partment provided yet other touches of  
glamour. An imposing combination of  
enamel, chrome, porcelain, and pol-  
ished aluminum highlighted the home  
of the neat V-16 engine inside Madame-  
X. The engine was in essence, two  
eight-cylinder blocks, angled at 45  
degrees and based on a large, cast-alu-  
minum crankcase.

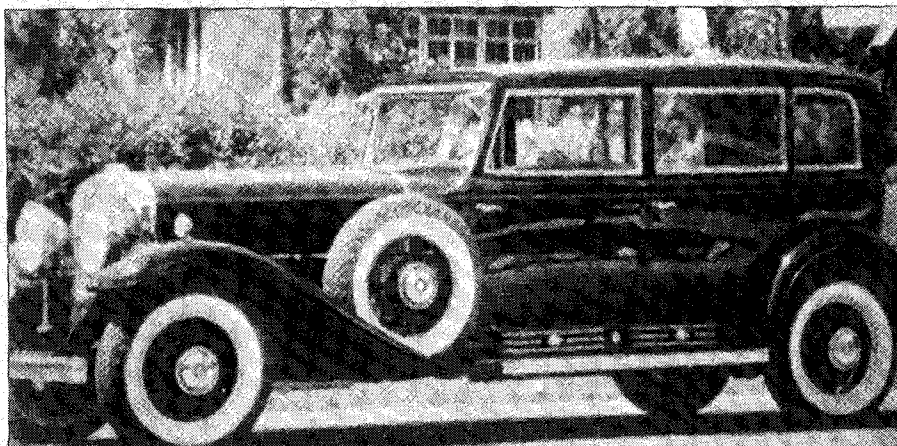
Manifolds were mounted outboard,  
and all wiring and hoses were covered  
and were out of sight. The sixteen small  
cylinders each featured a bore of three



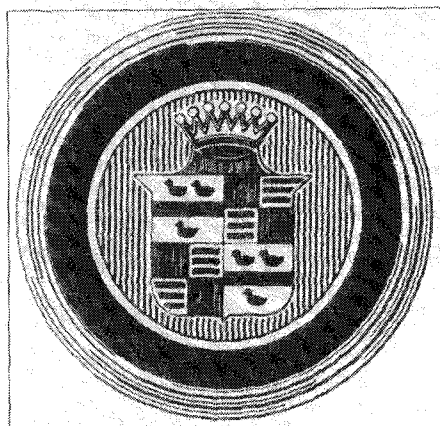
inches and a four-inch stroke which gave a 452 cubic-inch displacement, rated at 165 horsepower.

All Cadillac Madame-X models featured a closed-variety of styling. They were available from 1930 through 1933. During 1932 and 1933, the Madame-X was limited to five closed body styles and limited in production.

The highest-priced Madame-X model was listed at \$7,525, a hefty



Ironically, the first Madame-X, however, was not a Cadillac, but a LaSalle which also had been designed by the famous Harley Earl, head of GM's young automotive Design-Art-and-Color Section



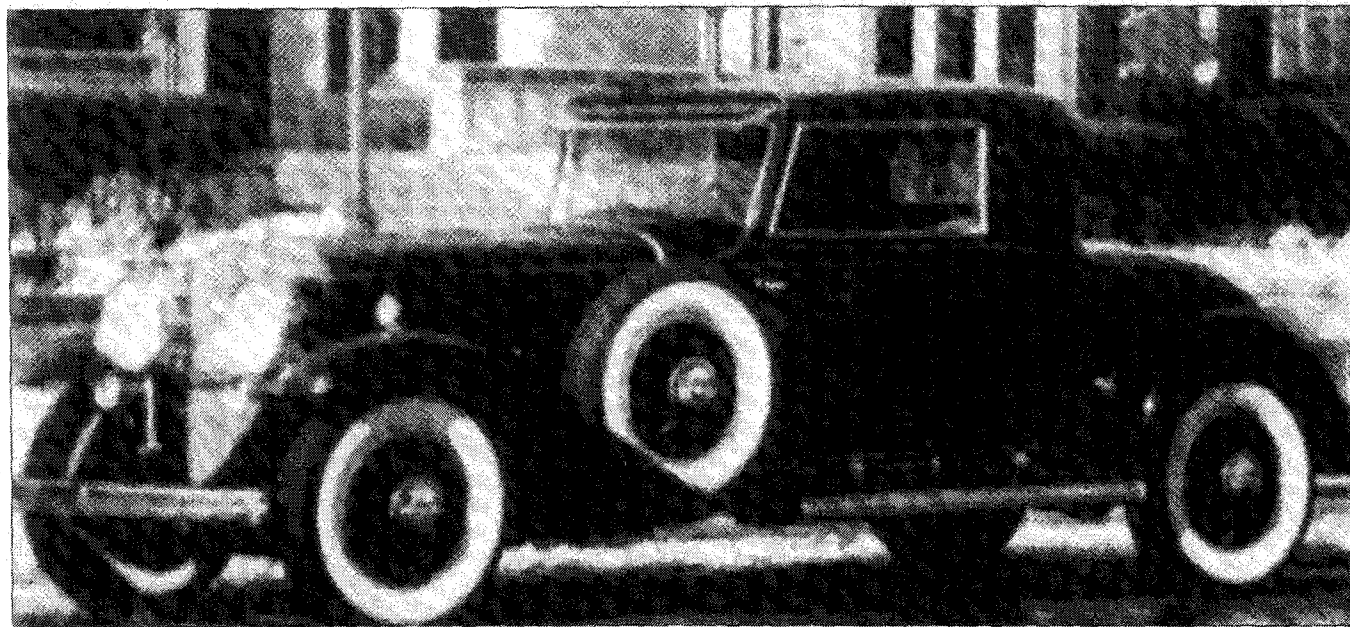
V-16 Logo Designed  
In 1930

price at that time, yet lower than the Cadillac Cabriolets, Broughams, or Limousines which cost over \$9,000. A number of the exquisite Madame-X models featured also gold-faced instruments as part of their plush interiors.

Although the exciting Madame-X was produced only for several years, the popular rakish windshield became a

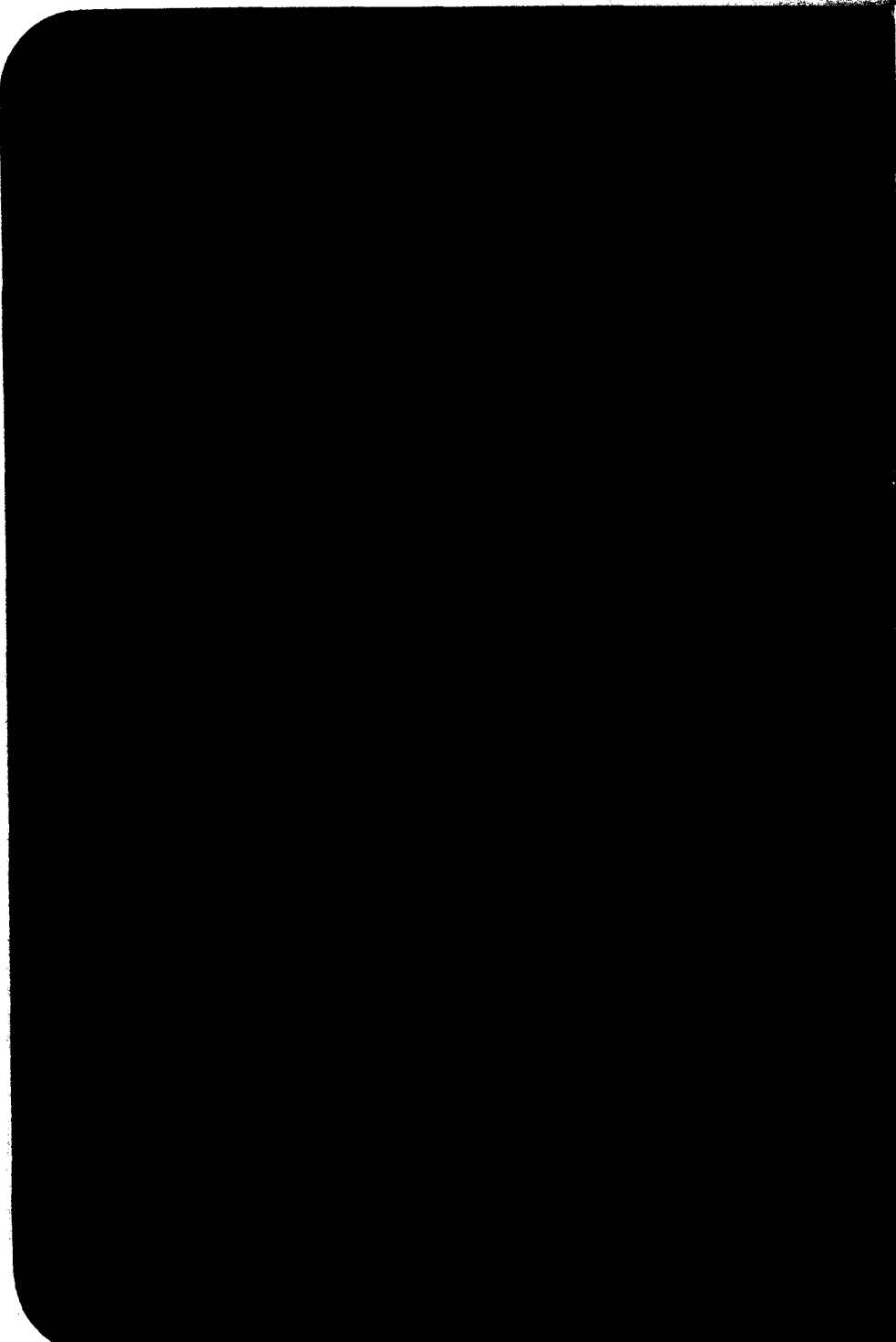
permanent, automotive-design feature.

Years later, the play Madame-X was made into a Hollywood film, and of course, the automobile featured in the film was a Cadillac V-16. The Madame had come full circle!



Harley Earl suggested the designation Madame-X for a series of Cadillac V-16 closed cars featuring dramatically slanted windshields





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Cadillac Motor Car Company

EDITION NO. 452-1

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

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## CHAPTER I

### Cadillac Service

THE owner of a Cadillac V-16 car has purchased not simply a fine piece of machinery, ingeniously designed and carefully built—he has purchased a pleasant and dependable mode of transportation. The car itself is only one factor in securing this transportation—the other factor is Cadillac Service, which is built upon a standard policy, clearly defined to the car owner and guaranteeing him efficient service everywhere at standard prices under factory regulation.

### Cadillac-La Salle Service Stations

Cadillac Service extends wherever Cadillac and La Salle cars are sold. Service stations conducted by Cadillac distributors and dealers are designated as "Authorized Cadillac-La Salle Service Stations" and are identified by the exclusive sign illustrated on this page. Wherever this sign is displayed, the owner will find an organization prepared to service Cadillac V-16 cars. This means proper equipment, factory trained personnel, a stock of genuine replacement parts and standardized policies and methods.

The car owner's first and most frequent contact with Cadillac Service will naturally be in the service station of the

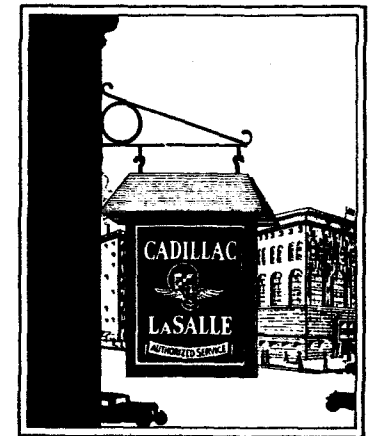


Fig. 1. Authorized Cadillac-LaSalle service stations display this sign at the service entrance.

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

### Service Card

As a means of introduction at other Authorized Cadillac-La Salle Service Stations, every purchaser of a Cadillac V-16 car is given credentials in the form of a Service Card. This card is mailed to him by the Cadillac factory immediately after the delivery of the car is reported by the distributor or dealer. It is supplied in a celluloid case, and is intended to be carried in a holder on the car. This holder is on the inner side of the flap over the pocket on the right hand side of the cowl.

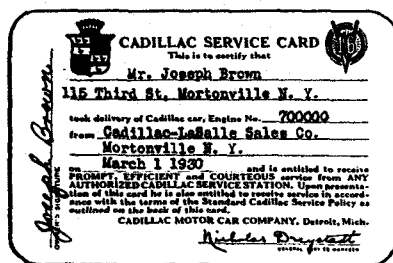


Fig. 2. The Service Card, when properly signed, identifies a Cadillac owner at any authorized Cadillac-La Salle service station.

Upon presentation of this Service Card to any Authorized Cadillac-La Salle Service Station, the car owner is entitled to uniform standard service in accordance with the Cadillac Owner Service Policy. This Policy is explained in detail in a certificate issued to each owner and mailed to him with his Service Card.

Briefly, it entitles the owner to:

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

abuse or neglect. This includes everything except lubrication, washing and storing.

2. Free replacement of any part which has proved to the Cadillac Motor Car Company's satisfaction to be defective in material or workmanship within one year after the delivery date, provided the mileage of the car does not exceed 12,000 and that the replacement was not made necessary by accident, abuse or neglect. This includes material and labor.

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

### Service Charges

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

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

### Repair Parts

Genuine Cadillac parts, manufactured to the same rigid specifications as the parts entering into the original assembly of the car, 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 authorized Cadillac distributor's or dealer's establishment.

### ***The Owner's Obligation***

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

1. To drive the car at moderate speeds for the first 500 miles.
2. To operate the car in accordance with the instructions contained in this manual.
3. To check the engine oil level every 100 to 150 miles, and add oil as often as necessary to keep the indicator at "full."
4. To check the tire pressure at least every week, and keep it up to the recommended pressure—45 pounds in front and 40 pounds in rear—on cars driven at high speeds, 50 pounds in front.
5. To add distilled water to the storage battery every 1000 miles, and in warm weather every 500 miles, or at least every two weeks.
6. To lubricate the car every 1000 miles, or once a month, in accordance with the lubrication schedule on page 32.
7. To take the car to an Authorized Service Station for inspection every 1000 miles, or at least once a month.

### ***Lubrication***

The first five items above are details which do not necessarily warrant a visit to the service station. For lubrication, however, the owner is urged to patronize Authorized Cadillac-La Salle

Service Stations, because they are prepared to furnish this service in a manner that cannot be duplicated elsewhere. Only approved lubricants are used, the specifications of which have been worked out by Cadillac engineers to give the best possible results. Workmen who specialize on Cadillac cars know exactly where lubrication points are located and how much lubricant to apply. The charge for this lubrication service is only about half a cent a mile, which includes the cost of the lubricants.

### ***Inspection***

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

The Cadillac V-16 owner is urged to take full advantage of this, not only while the car is new, but throughout its entire life.

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

## CHAPTER II

### Operation

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

### Locks

Each car is equipped with two each of two different keys. The handles of one set of keys are hexagonal in shape; these keys unlock the combination ignition switch and transmission lock, the lock on the front door, the spare wheel carrier and the battery box. The keys in the other set have oval handles; these keys unlock the rear doors of chauffeur driven cars, the rear decks of roadsters and coupes, the various package compartments and the tool box.

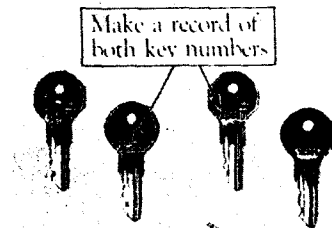


Fig. 3. Each car is supplied with four keys.

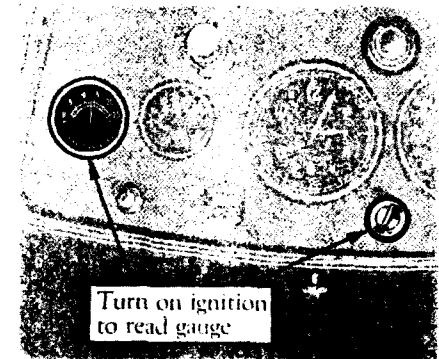
The right front door can be locked from the inside to prevent intruders from forcing their way into the car. This can be accomplished simply by turning the key to the locked position on the outside before entering the car. The door will then be locked from the outside, although it can be opened from the inside in the usual manner.

### Ignition Switch Lock

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

### Gasoline Gauge

The gasoline gauge, marked "Fuel," is the small dial on the extreme left. This gauge indicates in gallons the quantity of fuel in the tank at the rear of the car, and is operated electrically by current taken from the ignition circuit. To read from the gauge the quantity of fuel in the tank the ignition **must** be switched on.



\*Fig. 4. The gasoline gauge is operated electrically by current from the ignition circuit.

### Throttle Control

The throttles of the two carburetors are controlled by a hand lever and a foot pedal or accelerator. The normal position of the hand lever for driving the car is all the way up (at "Close"). In this position the throttles of the carburetors are open just enough to permit the engine to run at idling speed after it is warm. For starting, however, the lever should

\*The instrument panel illustrations in this book are all taken from the straight type panel. The arrangement of the instruments is slightly different on the V-type panel used on certain body styles.

be moved approximately one-fourth the way down, and should be left in this position until the engine is warm enough to permit the lever to be returned to the idling position without stalling the engine. (Also see Chapter on "Cold Weather Operation.")

### Carburetor Choke Control

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

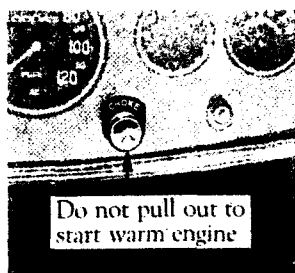


Fig. 5. The choke button must be held out while the starter is cranking the engine.

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

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

On the other hand, it should not be pulled out any further or left out any longer than is necessary to accomplish these results, because some of the excess liquid gasoline in the enriched mixture does not burn and washes off the oil on the cylinder walls, interfering with proper lubrication of the pistons. Push the button all the way in as soon as this can be done without causing "popping-back."

any effect, the button must be pulled out and kept partly out during the cranking operation.

### Spark Control

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

A hand control is also provided. This is the button at the left on the instrument panel. This button should be pushed all the way in (full advance) for starting and for all ordinary driving. The button can be pulled partly out to retard the spark in case of "ping" caused by carbon, heavy pulling, the use of regular (not anti-knock) gasoline, or in case there should ever be occasion to crank the engine by hand.



Fig. 6. Drive with spark control as far advanced as possible.

The V-16 engine is a high compression engine and it will perform most satisfactorily when an anti-knock fuel is used. Regular gasoline can be used, although this may necessitate driving with the spark slightly retarded to avoid "ping."

### Starter Pedal

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

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

taken. The following, in their proper order, are the various steps that must be performed to start the engine:

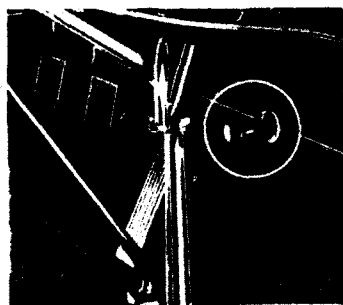


Fig. 7. The starter pedal is only one of the controls that must be used to start the engine.

1. Place the throttle lever about one-fourth the way down from the idling position.
2. See that the ignition control button is all the way in.
3. Switch on the ignition.
4. Make sure that the transmission control lever is in neutral.

5. Unless the engine is still warm, pull back the choke button. If the engine is still warm, do not pull back the choke button unless the engine fails to start on the normal mixture.

6. Push the starter pedal forward and hold it until the engine starts. Release it immediately as soon as the engine starts. (See below for probable causes for the engine failing to start.)

7. Push the choke button partly in as soon as the engine starts, and all the way in as soon as the engine is warm enough to permit it.

8. Note whether pressure is indicated on the oil pressure gauge and stop the engine at once if no pressure is indicated.

9. Move the throttle lever up to the idling position as soon as the engine is warm enough to permit it.

In cold weather, disengage the clutch before pressing down the starter pedal, and hold it down during the cranking operation. This relieves the starter of the necessity of turning the transmission gears which are immersed in lubricant. The

additional load is small in warm weather when the lubricant is thin, but in cold weather the power required to turn the gears through the thickened lubricant adds unnecessarily to the demand upon the battery.

## What To Do If The Engine Fails To Start

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

The ignition may be switched off.

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

There may be no gasoline in the vacuum tanks on the dash. If the fuel supply should give out on the road, so that the vacuum tanks on the dash become empty, it will be necessary after refilling the tank to add gasoline to each of the vacuum tanks.

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

## Oil Pressure Gauge

The small dial at the left of the clock is the oil pressure gauge. This gauge does *not* indicate the *quantity* of oil in the engine. It indicates only the *pressure* under which the oil is forced to the engine bearings.

When the engine is not running,



Fig. 8. The oil gauge does not indicate quantity; it only shows the pressure under which oil is forced to the engine bearings.



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

### Ammeter

The ammeter should indicate on the "Charge" side most of the time. Otherwise, more current will be taken out of the battery than is put into it and the battery will eventually become fully discharged.

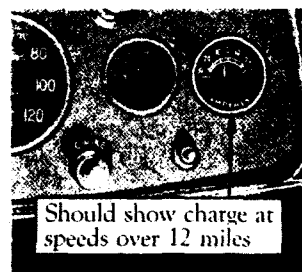


Fig. 9. The ammeter indicates the amount of electrical current flowing to or from the battery.

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

### Clutch Pedal

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

Do not drive with the foot resting on the clutch pedal. The Cadillac V-16 clutch operates so easily that even the weight of the driver's foot may unintentionally cause the clutch to slip.

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

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

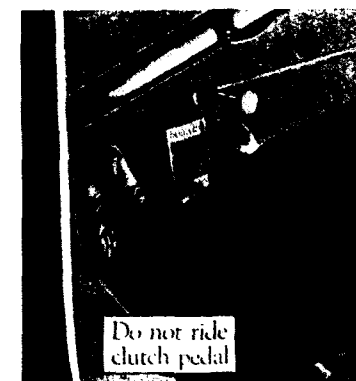


Fig. 10. A good driver uses the clutch pedal only when shifting gears or about to stop.

### Transmission Control

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

the control lever, the same as with the conventional transmission.

The only difference is in the manner of moving the control lever. With the conventional transmission, it is customary when shifting to a higher gear to hesitate momentarily in neutral and then move the lever quickly to its new position. With the Cadillac Syncro-mesh transmission there is no necessity either for the hesitation in neutral or for the rapid movement of the lever during the latter part of the shift. Instead, the movement of the control lever should be one smooth, continuous movement.

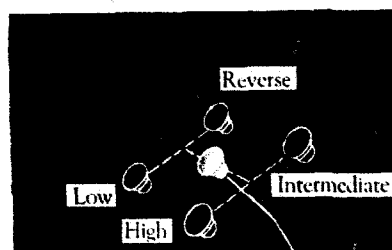


Fig. 11. The control lever positions are the same as for the conventional type of transmission.

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

Low to intermediate  
Intermediate to high  
High to intermediate

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

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

## Coasting

In coasting down grades, it is recommended that the transmission be left in gear and the clutch engaged. With the throttle in the idling position, the car is thus made to drive the engine, the resistance of which assists the brakes and saves wear on the brake lining. It must be remembered that the brakes are subjected to much more severe use on grades than on the level, because gravity acts continuously, whereas on the level, the brakes need absorb only the momentum of the car.

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

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

## Brakes

The foot brakes are internal brakes of the shoe type, applied on all four wheels through a mechanical linkage, and supplemented by a vacuum assister.

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

As the brake lining wears, the pedal must be pushed farther down to apply the brakes. Do not wait until the pedal goes all the way to the floor board before having the brakes readjusted. Readjustment is recommended as soon as the pedal must be pushed down to within one inch of the floor board. A temporary adjustment of the brakes is explained on page 49.

For parking, the brakes are operated by the hand lever at the right of the transmission control lever.

### Lighting Switch

The lighting switch control is at the upper end of the steering column in the center of the steering wheel. The lever has three positions besides the "off" position, which is the straight down position. Turning the lever to the left turns on the parking

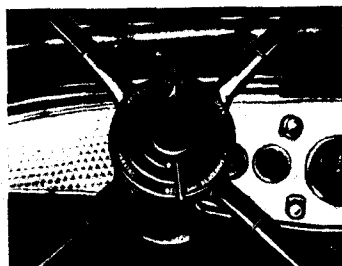


Fig. 12. The lighting switch control is at the hub of the steering wheel.

lamps on the fenders and the rear lamp. The first position of the lever when turned to the right switches on the headlamp lower beams and the rear lamp, while the second position to the right switches on the headlamp upper beams and the rear lamp.

The instrument lamps are controlled by a separate switch button at the right of the instrument panel.

The lamp bulbs that are used are as follows:

Lamp	Voltage	Candle-Power
Headlamps	6-8	21 (Two-Filament) Mazda No. 110
Stop lamps	6-8	15
Parking lamps	6-8	3
Instrument lamps	6-8	
Rear lamps	6-8	
Closed car lamps	6-8	

### Danger of Running Engine in Closed Garage

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

Carbon monoxide, a deadly poisonous gas, is present in the exhaust of all internal combustion engines. Most people are already familiar with carbon monoxide in the form of illuminating gas, or in the gas produced by furnaces and stoves when insufficient air is supplied to give complete combustion. But illuminating gas and coal gas have an unpleasant odor, which serves as a warning, whereas carbon monoxide, as produced in the internal combustion engine, is colorless, tasteless, and almost odorless, so that the victim may be overcome before he is aware of the danger. When the engine exhausts into the open air, the carbon monoxide is so diluted that it has no effect. It is when the engine is run for a time in a closed room that the proportion of carbon monoxide in the air may increase to the point at which continued breathing of it would be fatal. The United States Public Health Service advises that the average automobile engine warming up in a single car garage will give off enough carbon monoxide in three minutes to endanger life.

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

## CHAPTER III

### Equipment

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

#### Windshield and Ventilation

Three different types of windshields are used on the various Fleetwood body styles furnished on the Cadillac V-16. The first is the one-piece slanting windshield that can be moved up and down by means of the handle just above the windshield (Fig. 13).

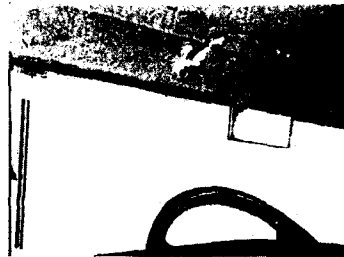


Fig. 13. The straight type windshield is controlled by the handle above the windshield.

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

Another type of windshield is the V-type windshield illustrated in Fig. 14. Each panel of this windshield can be swung outward after unhooking the clamps at the lower corners of the

glass; and can be held out in any desired position by simply tightening the thumb screw at the top of the frame.

The windshield used on open cars pivots at both top and bottom. The glass can be swung outward by loosening the thumb screws at the upper corners of the windshield frame. The entire windshield and frame can be folded forward by loosening the thumbscrews at the lower corners.

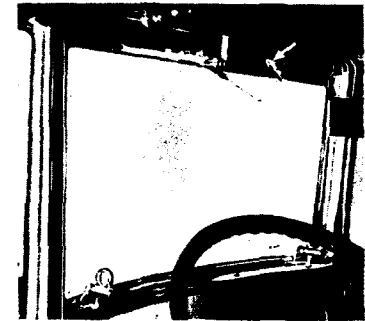


Fig. 14. The V-type windshield used on certain body styles can be held open by tightening the thumbscrew indicated by the arrow.

In addition to the windshield, some body styles are also equipped with ventilators either at the top or on the sides of the cowl.

In warm weather, satisfactory ventilation in the front compartment cannot be expected unless the hood doors are open. Ordinarily, these should be opened at the beginning of warm weather and left open for the season. The temperature in the front compartment can thereafter be controlled by the windshield and ventilators.

#### Windshield Cleaner

Double blade windshield cleaners are provided on all types of windshields. This cleaner is controlled by the small button on the left of the instrument panel.

The cleaner used with the one-piece windshield can be made to operate on either one side or all of the windshield by means of a two-position button. In the first position both blades operate on the left side of the windshield; in the second position, the blades clean the entire windshield.

#### Adjustable Seats

All cars except those that are intended to be chauffeur-

driven have adjustable front seats. The entire front seat can be moved forward or backward by means of a handle on the center of the seat base, a few inches above the floor.

The rear seats are also adjustable on a number of body styles. The seat cushion and base can be moved forward and backward by means of a control handle in the seat base similar to that for the front seat. In addition, the angle of the seat back can be changed by means of a handle which is located in back of the folding arm rest in the center of the seat back.

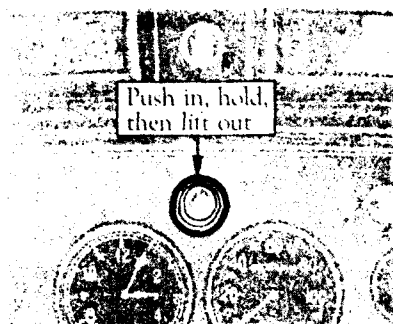


Fig. 15. The cigar lighter on the instrument panel is of the "pass around" type.

### Cigar Lighters

Cordless lighters are provided on the instrument panel and with the smoking sets of the various body styles. To use this type of lighter, press it into its socket and hold it in contact until the heating element gets red, then lift it out for use.

### Tools

The tools comprising the standard equipment are listed below:

- |                               |   |
|-------------------------------|---|
| 1. Hammer                     | 9. Hub cap wrench                       |
| 2. Monkey wrench              | 10. Brace wrench (wood and disc wheels) |
| 3. Large screw-driver         | 11. Jack handle                         |
| 4. Small screw-driver         | 12. Jack                                |
| 5. Crescent adjustable wrench | 13. Tool bag                            |
| 6. Oil can                    | 14. Lubrication chart                   |
| 7. Spark plug wrench          | 15. Operator's Manual                   |
| 8. Starting crank             |   |

### Tool Compartment

The compartment for the tool equipment is between the left-hand running board and the frame, and is accessible upon open-

ing a door in the left-hand dust shield. The lock on the tool box door is operated by the key for the package compartments, not by the ignition key.

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

The tools are contained in an inner box, the cover of which is held in place by the rod shown in Fig. 16b. Force this rod out of the depressions in the handles on the cover of the box, and let the rod drop to the position shown in Fig. 16c. The cover of the box can then be removed by means of the two handles.

The door of the battery compartment operates in the same manner as the tool compartment, but it is unlocked with the ignition switch key. This arrangement is employed so that the car can be left for service, including battery attention, without leaving the key to the package compartments.

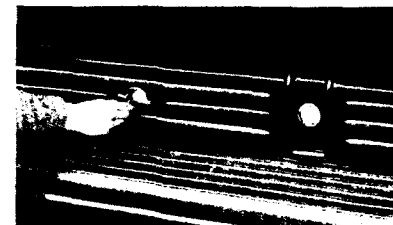


Fig. 16a. The tool box door can be unlocked with the package compartment key.

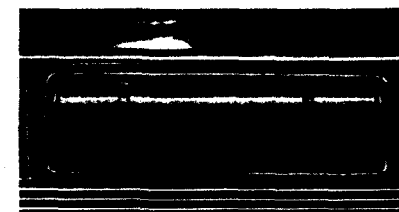


Fig. 16b. A retaining rod holds the inner cover of the tool box in place.

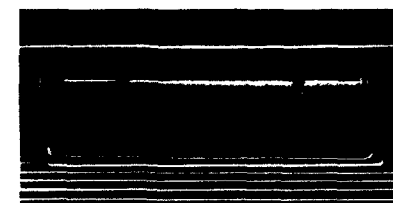


Fig. 16c. The inner cover can be removed after the retaining rod is dropped down.

## Tires

### Inflation Pressure

For normal driving, the front tires should be inflated to a pressure of 45 lbs. and the rear tires to 40 lbs. The inflation pressure should be checked at least weekly, and should never be permitted to drop more than 5 lbs.

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

### Spare Wheel Carrier

To remove a spare wheel from the carrier, unlock the lock and take it out, using the key as a handle. It may be necessary to hold on to the lock while turning the key. Then unscrew the clamping screw underneath the lock, after which the large dust shield can be removed and the wheel taken off the carrier.

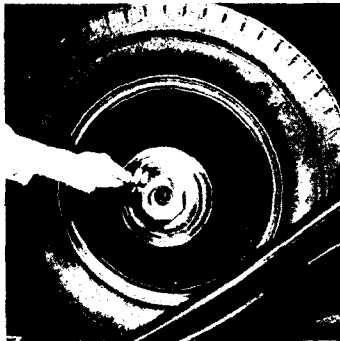


Fig. 17. To remove a spare wheel, unlock the lock, remove the screw and the dummy hub cap, and lift the wheel from the carrier.

To reinstall a spare wheel, mount it on the carrier, place the large dust shield in position and tighten the clamping screw. Then snap the lock back into place.

These instructions apply both to spare wheel carriers on the rear of the car and to carriers in the front fender.

### Spare Tire Carrier (Standard Wood Wheels)

To remove the spare tire from the carrier, unlock the lock and remove it, using the key as a handle. It may be necessary to hold on to the lock while turning the key. Unscrew the clamping screw with the brace wrench furnished in the tool equipment and remove the rim clamp, taking care not to lose the clamping screw. Remove the tire with rim, by pulling it out at the bottom and then lifting it off the carrier.

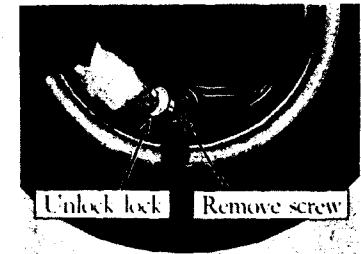


Fig. 18. To remove a spare tire, unlock the lock, remove the screw and take off the clamp.

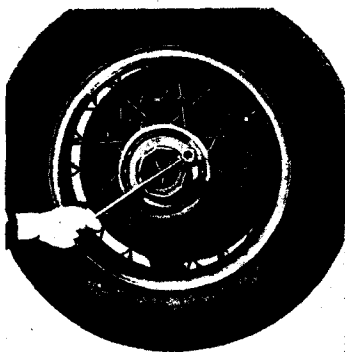
To place a tire and rim on the carrier, reverse the above order. After tightening the clamping screw, unlock the lock and put it into place.

### Changing Tires

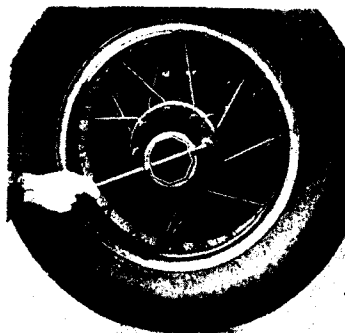
If an inflated tire is always carried on the spare rim or wheel, the driver will seldom or never have to disassemble a tire from the rim. In case of tire trouble, it is then merely necessary to remove the rim or wheel with the flat tire and then install the spare in its place. Illustrated directions for performing this work on wire and on standard wood wheels are given on pages 28 and 29. Disc and demountable wood wheels are changed in the same manner as wire wheels except that the hub caps should not be removed.

### Tire Balancing Marks

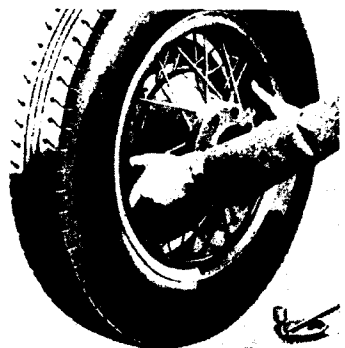
The tires are balanced to offset the weight of the valve stem. If a tire is removed, it must be re-installed in its original position.



*Fig. 19a.* Remove the hub cap with the wrench in the tool kit. Hub caps are marked with arrows showing the direction in which they screw on and off.



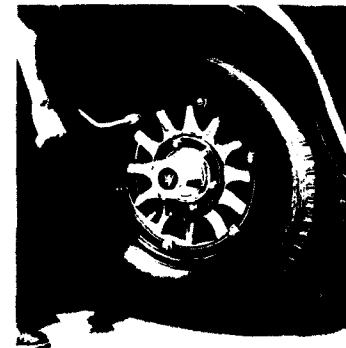
*Fig. 19b.* Jack up the axle until the weight of the car is off of the wheel, but with the tire still dragging. Loosen the cap screws around the wheel hub by turning them in a counter-clockwise direction with the wrench. Then jack the wheel up further, remove the cap screws and take the wheel off of the hub.



*Fig. 19c.* To mount a wheel simply set it up on the hub and start the cap screws by hand. Then tighten the screws with the wrench, but do not tighten them in rotation. After tightening one screw, tighten the screw directly opposite.

*Fig. 19.* Changing Wire Wheels

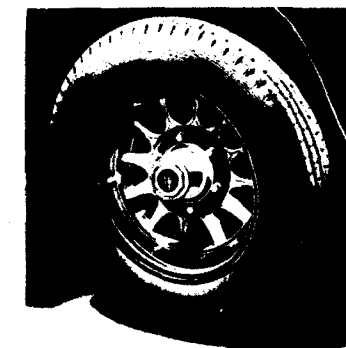
*Fig. 20a.* Jack up the wheel until the tire clears the ground. Remove the dust cap and clamping nut from the valve stem. Remove the six rim clamps, unscrewing them with the brace wrench supplied in the tool kit.



*Fig. 20b.* Rotate the wheel until the valve stem is at the top, and pull the bottom of the rim away from the wheel.



*Fig. 20c.* Then rotate the wheel until the valve stem approaches the bottom, when the rim and tire will roll free from the wheel and can be removed without lifting.



*Fig. 20.* Changing Rims (Standard Wood Wheels)

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

with respect to the rim; otherwise the tire and wheel will be unbalanced.

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

## CHAPTER IV

### Lubrication

#### *Lubrication Schedule*

**S**YSTEMATIC lubrication, at regular mileage intervals, is the only kind that is effective. On page 32 is a complete lubrication schedule, which, if faithfully followed, will insure correct lubrication for each wearing surface.


The unit of the schedule is 12000 miles, which is divided into twelve 1000-mile intervals. Corresponding to these is a series of twelve consecutive groups of lubricating operations. When the car has traveled 1000 miles, the points enumerated under Lubrication No. 1 should receive attention. At 2000 miles, Lubrication No. 2 is due, and so on until at 12000 miles, Lubrication No. 12 should be performed. At 13000 miles, the schedule begins again with Lubrication No. 1.

It will be noticed from the schedule that there are actually only four different lubrication operations, but that they are numbered according to the various times that they come due.

Although this schedule is expressed in terms of miles, it is intended that the car be lubricated once each month if the mileage traveled is less than 1000 since the last lubrication operation was performed. This lubrication work can be done while the car is in the service station for its regular monthly or 1000-mile inspection.

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





## CADILLAC LUBRICATION SCHEDULE

OWNER'S NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

ENGINE NO. \_\_\_\_\_ DATE DELIVERED \_\_\_\_\_

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

		LUBRICANT	LUBRICATION NO. AND MILEAGE AT WHICH DUE											
			1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
LUBRICATION NOS. 6 AND 12	LUBRICATION NOS. 3 AND 9	CHECK RADIATOR LEVEL	WATER OR ANTI-FREEZE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		ADD ENGINE OIL AS NECESSARY	ENGINE OIL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		STARTER, GENERATOR AND DISTRIBUTOR OIL CUPS	ENGINE OIL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		BRAKE PINS AND CONNECTIONS	ENGINE OIL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		DOOR HARDWARE	ENGINE OIL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		GREASE GUN CONNECTIONS	CHASSIS GREASE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	LUBRICATION NOS. 2, 4, 8 AND 10	WATER PUMP GREASE CUP	WATER PUMP GREASE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		*ADD WATER TO STORAGE BATTERY	DISTILLED WATER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		CHECK TIRE INFLATION		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		DRAIN AND REPLACE ENGINE OIL	ENGINE OIL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		CLUTCH RELEASE BEARING	WHEEL BEARING GREASE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		TEST OIL FILTER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LUBRICATION NOS. 1, 5, 7 AND 11	TRANSMISSION—ADD LUBRICANT	GEAR LUBRICANT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	REAR AXLE—ADD LUBRICANT	GEAR LUBRICANT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	STEERING GEAR—ADD LUBRICANT	GEAR LUBRICANT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	TIMER DISTRIBUTOR CAM	LIGHT ENGINE OIL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	FRONT BRAKE TRUNNIONS AND BRAKE CAM BEARINGS	CHASSIS GREASE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	WHEEL BEARINGS	WHEEL BEARING GREASE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	FAN	CHASSIS GREASE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	SPEEDOMETER DRIVE SHAFT	CHASSIS GREASE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	**REFILL SHOCK ABSORBERS	SPECIAL OIL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	**FLUSH COOLING SYSTEM		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

THE FOLLOWING OPERATIONS CANNOT BE PLACED ON A MILEAGE BASIS AND ARE NOT INCLUDED IN THE ABOVE SCHEDULE:  
 REMOVE OIL PAN AND CLEAN PAN AND SCREEN—WHenever OIL FILTER IS CHANGED  
 TURN REAR AXLE AND TRANSMISSION LUBRICANT AS REQUIRED FOR LOW TEMPERATURES  
 DRAIN AND REPLACE REAR AXLE AND TRANSMISSION LUBRICANT—AT BEGINNING OF WILD WEATHER IN SPRING  
 IN SUMMER, INSPECT BATTERY EVERY 100 MILES OR AT LEAST EVERY 2 WEEKS.  
 \*\*RECOMMENDED BUT NOT INCLUDED IN LUBRICATIONS 6 AND 12.  
 RECORD ON OTHER SIDE

Fig. 21. 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.

## Lubrication Chart

The lubrication chart (18 x 24 inches in size) which accompanies this manual gives complete detailed instructions for lubricating the car. All of the points which require lubrication are designated on this chart, together with the kind of lubricant to be used, the method of applying it and the frequency with which it should be applied.

The operations are grouped on the chart in the same manner as on the schedule shown in Fig. 21. If the car is lubricated at an "Authorized Station," this schedule will be followed; if not, whoever does the lubrication should follow the schedule and chart exactly.

## Lubricants

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

The owner is urged to consult the distributor or dealer from whom he purchased his car in regard to the names of lubricants which have been tested and approved for use in the Cadillac V-16 car.

## Engine Oil

The chart of engine oil recommendations given on page 34 indicates the proper grades of oil to be used for average driving and for prolonged high speed driving.

## Gear Lubricant

Lubricant conforming to the specifications for Gear Lubricant must be used in the transmission, rear axle and steering gear. It is particularly important that only recommended lubricants be used in the transmission. Oil or soap greases will *not* perform satisfactorily.

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

#### ENGINE OIL RECOMMENDATIONS

TYPE OF SERVICE	SUMMER	WINTER	
	All Temperatures Above 30° F.	Between 32° and 15° Above	Below 15° Above Zero
AVERAGE DRIVING (No prolonged high speed driving)	S. A. E. visc. 40 or 50	S. A. E. visc. 20	S. A. E. visc. 10
		<i>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.</i>	
PROLONGED HIGH SPEED DRIVING	CADILLAC APPROVED "HEAVY DUTY" OILS—SUMMER AND WINTER		
	<p>These oils have an S. A. E. viscosity of 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.</p> <p>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.</p>		

\*The system used in this table to designate body or viscosity is the one recently 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.

### Chassis Grease

Lubricant conforming to the specifications for Chassis Grease is recommended for all chassis points fitted with grease gun connections. Do not use ordinary cup grease, as such greases are not effective enough to lubricate satisfactorily over the 1000-mile interval.

### Wheel Bearing Grease

Greases approved under the specifications for Wheel Bearing Grease are suitable for lubricating the wheel bearings and the clutch release bearing.

This grease is not recommended for chassis lubrication, as Chassis Grease is much more effective. Furthermore, Chassis Grease or ordinary cup grease should not be used in the wheel bearings as such lubricants do not have a sufficiently high melting point to render satisfactory service.

### Water Pump Grease

A water-resistant calcium soap grease is recommended for use in the water pump grease cup. Only greases that meet the specifications for Water Pump Grease should be used; other greases will be dissolved into the cooling system liquid.

The owner of a Cadillac V-16 car is urged to have his car put on schedule lubrication at an authorized Cadillac-La Salle service station; in this way he is assured of having the proper lubricants used for all lubricating points at the proper mileage intervals.

### Engine Lubrication

The supply of oil is carried in the cast aluminum oil pan that covers the bottom of the crankcase. The oil is circulated by a gear pump inside of the crankcase. The pump is driven by a

vertical shaft, which is, in turn, driven by a spiral gear on the camshaft. The oil circulated by the pump lubricates the main and connecting rod bearings, the camshaft bearings, the cylinder walls, pistons and piston pins, the front end chains and the valve mechanism.

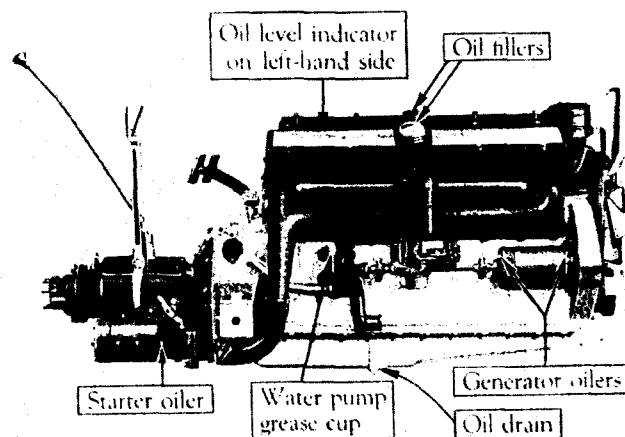


Fig. 22. Showing the location of the oil filler, oil level indicator, oil pan drain plug and other lubrication features.

There are a few points on the engine that are not taken care of in the pressure system. These are the starter, generator and distributor oil cups, the fan and the water pump. Lubricating instructions for these points are given in the lubrication chart.

### 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 (Fig. 22) indicates "Full." As the oil level descends, the indicator indicates "Fill" and then "MT" (Empty). Oil should be added as soon as the indicator ball has dropped to "Fill."

If the indicator indicates "MT," under no circumstances should the engine be run until oil has been added.

The mileage interval at which oil must be added depends upon individual circumstances. It is recommended that the oil level indicator be checked every one hundred to one hundred and fifty miles, although it is improbable that oil will be required as frequently as this. Oil can be added in either of the two fillers at the top of each bank of cylinders.

### Crankcase Ventilating System and Oil Filter

Cadillac V-16 engines are equipped with a crankcase ventilating system, which prevents contaminating of the lubricating oil from seepage vapors; and an oil filter, which removes any dirt or solid matter from the oil.

The air intake for the crankcase ventilating system, located at the front of the crankcase on the left-hand side, is equipped with an air cleaner which prevents dust from entering the crankcase.

The screen in this air cleaner should be removed and cleaned as soon as it becomes clogged. To determine when cleaning is required, the screen should be inspected at regular intervals. Inspection every 1000 miles is recommended if the car is driven very much on dusty roads.

Cleaning is required if the screen is covered or nearly covered with dust. To take out the screen, remove the four cap screws holding the intake to the crankcase and lift off the intake assembly. The screen is held in place by the cap at the top of the intake and can be lifted out after this cap has been removed.

The screen can be cleaned by washing it in gasoline. Before re-installing, it should be immersed in engine oil until it is thoroughly saturated.

The oil filter gradually becomes filled with the solid matter taken from the oil until it becomes so clogged that it ceases to function.

As oil for lubrication of the overhead valve mechanism is taken direct from the oil filter, it is extremely important to replace the filter cartridge before it becomes so clogged that it will not readily pass oil. It is therefore recommended that the filter be tested every 2000-miles so that the cartridge can be replaced as soon as this is necessary.

This test can be made by simply removing one of the oil filler covers and noting whether or not oil is dripping from the rocker arm bushings. If oil does not drip from the bushings, the cartridge must be replaced.

The lubrication schedule as followed by authorized Cadillac-La Salle service stations provides for this test as part of the regular 2000-mile lubrication. Filter cartridges for replacement can be obtained from Cadillac distributors and dealers.

The cartridge should also be replaced after 12,000 miles of use, even if the test does not indicate a badly clogged filter.

The oil pan and screen should be removed and cleaned with kerosene or gasoline whenever the oil filter cartridge is replaced.

### **Replacing Engine Oil**

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

To drain the oil, simply remove the drain plug (Fig. 22). Be sure to reinstall the drain plug before adding the fresh oil. Ten quarts of fresh oil should be added, or enough to bring the oil level indicator ball to "Full."

## **CHAPTER V**

### **Cold Weather Operation**

Satisfactory operation of the car in freezing weather depends upon having the car prepared for cold weather and in giving it the special attention which is required at that time. In this chapter has been grouped all the information relating to care and operation of the car during cold weather. It should be reviewed just prior to the beginning of the winter season.

### **Preparing for Cold Weather**

#### **Anti-Freezing Solutions**

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

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

There are two principal objections to denatured alcohol. Alcohol is lost by evaporation, especially on heavy runs, and unless the solution is tested periodically and sufficient alcohol added to replace the loss by evaporation, the engine or radiator, or both, are likely to be damaged by freezing.

The car finish is damaged by contact with the alcohol solution or vapors from the solution. Any alcohol accidentally spilled on the finish should be flushed off immediately with a large quantity of water.

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

Lowest Temperature Expected	Per cent by Volume	Specific Gravity (at 60° F.)	Qts. Alcohol required to make 7 gals. solution
10° F.	30	.9668	8½
0° F.	38	.9567	10¾
-10° F.	45	.9475	12¾
-20° F.	51	.9350	14¾
-30° F.	57	.9260	16

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, except that any solution lost mechanically, by leakage, foaming, etc., must be replaced by additional new anti-freezing solution. These solutions under ordinary conditions are not injurious to the car finish.

The principal objections to glycerine and ethylene glycol are the tendency of these solutions to loosen the scale and iron rust which forms in the water passages of the cylinder block and head, and the difficulty of securing and maintaining tight, leakproof connections. It is absolutely necessary to thoroughly clean and flush the entire cooling system before glycerine or ethylene glycol is used.

It is also necessary to tighten or replace the cylinder head gaskets and pump packing. The cylinder head gaskets must be kept tight to prevent the solution from leaking into the crank-case 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.

Glycerine or ethylene glycol should be used in accordance with the instructions and in the proportions recommended by the anti-freeze manufacturer.

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 correction must be made for the difference in temperature, otherwise large errors may result. In some cases these errors may be as large as 30 degrees Fahrenheit.

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

### Capacity of Cooling System

The capacity of the cooling system is 7 gallons when filled to the level of the overflow pipe. The cooling system can be filled to this level because the overflow pipe is connected to a condenser tank.

This condenser tank prevents the loss of liquid, particularly anti-freeze, by evaporation, and functions automatically providing there is an air-tight seal at the radiator cap. It is important, therefore, to keep the radiator cap turned down tightly at all times.

### Winter Lubrication

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

The chart of engine oil recommendations on page 34 gives the proper grade of oil to be used for cold weather driving. It will be noted that lighter oils can be used for cold weather providing no prolonged high speed driving is done. For prolonged high speed driving, "Heavy duty" oils must be used. Authorized Cadillac-La Salle Service Stations are prepared with full information on winter lubrication.

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

### **Storage Battery**

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

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

### **Gasoline System**

The carburetors on the Cadillac V-16 engine have automatic compensation for temperature. Nevertheless it is a good plan to have the carburetor adjustment checked when cold weather arrives. This inspection should give special attention to the carburetor choke control to make sure that the enriching device is fully effective at each carburetor when the choke button is operated.

In warm weather, a small amount of water in the gasoline has little or no effect on the running of the engine. In freezing weather, however, even a small amount of water may freeze and stop the entire flow of fuel to the carburetor. One of the things to be done in preparing for winter weather, therefore, is

to clean the gasoline filters and the sediment chambers in the gasoline systems.

## **Starting the Engine**

### **Choke Button**

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

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

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

### **Priming the Carburetors**

In extremely cold weather, if the engine does not start after cranking for a few seconds with the choke button fully applied, release the starter pedal. Then prime the carburetors by opening and closing the throttle once or twice rather rapidly with the accelerator. Opening and closing the throttle operates a throttle pump on each carburetor and raises the level of the

gasoline in the carburetors. The carburetors should never be primed in warm weather and should not be primed unnecessarily in cold weather. Excessive priming is likely to make starting difficult rather than easy.

### ***Position of Throttle Hand Lever***

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

### ***Position of Spark Control***

It is the practice of some drivers to move the spark control button all the way to "retard," whenever starting the engine. This is the correct position if the engine is to be cranked by hand, but if the engine is to be cranked with the starter, the spark button should be left in the fully advanced position.

### ***Use of Starter***

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

### ***Use of Accelerator Before Engine Is Warm***

In cold weather, after the engine has been started and before it has run long enough to become warm, the engine cannot deliver its normal power, and it should not be called upon to do so. In accelerating the engine to start the car and in accelerating the car after the transmission is in gear, do not open the throttle suddenly or too far. To do so is not only to invite "popping back" in the carburetor, but to increase the amount of excess unvaporized gasoline in the combustion chambers, both of which results are undesirable.

## CHAPTER VI

### General Care

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

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

#### *Storage Battery*

The storage battery is carried in a compartment between the right-hand running board and the frame. The door of the compartment operates the same as the door of the tool compartment, described on page 25.

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

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

As the storage battery is charged and discharged, the solution reacts chemically with the plates of the battery, the specific gravity of the solution changing as the reaction proceeds. The state of charge of the battery is thus indicated by the specific gravity of the solution. As the battery is charged, the specific gravity of the solution increases, reaching 1.270 to 1.285 when the battery is fully charged. The specific gravity of the solution decreases as the battery is discharged. A fully discharged battery has a specific gravity of 1.150 to 1.165.

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

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

#### *Cooling System*

The cooling system should be kept filled with 7 gallons of water, except in freezing weather, when a suitable anti-freezing solution, such as those described on page 39, must be used.

The drain valve for the cooling system is in the water inlet





Fig. 23. The entire cooling system can be drained by opening this one valve.

elbow just below the water pump on the right side of the crank-case.

The cooling system should be drained and flushed every 6000 miles. If possible, this should be done at a Cadillac service station, or where there are facilities for reversing the flow of water through the radiator. If this is not possible, use the following method:

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

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

### Gasoline Filter

A gasoline filter (Fig. 24) is provided in each gasoline line between the vacuum tank and the carburetor. Each filter has a glass bowl through which the accumulation of water and sediment can be easily seen. The bowl should be removed and the gauze screen should be cleaned as soon as any accumulation appears in the bowl. This can be done as follows:

First shut off the gasoline by turning clockwise the small

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

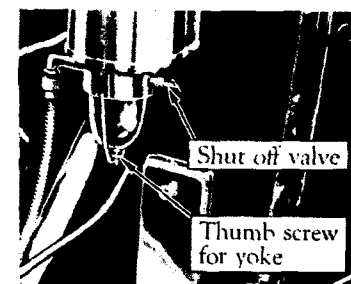


Fig. 24. The two gasoline filters should be removed and cleansed regularly.

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

There is also a strainer in each vacuum tank at the point where the gasoline enters the inner chamber. These strainers should be removed and cleaned occasionally. They are accessible after disconnecting the feed pipes and unscrewing the inlet elbows.

### Temporary Brake Adjustment

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

Each brake is fitted with an adjusting nut on the cam lever, as shown in Fig. 25. To tighten the brake adjustment turn all four adjusting nuts half a turn clockwise. These adjusting nuts lock each sixth of a turn.



Fig. 25. A temporary brake adjustment can be secured by turning the adjusting nut on each brake clockwise one-half turn. The front brake is shown above at the left, the rear brake at the right.

## CHAPTER VII

### Storing Car

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

#### Engine

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

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

Drain the cooling system.

#### Storage Battery

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

Shortly before the car is used for the last time, distilled water should be added to bring the level of the solution up to the

bottom of the filling tubes. (See page 46.) After the water added has had an opportunity to mix thoroughly with the acid solution by running the car or engine, the specific gravity should be taken with a hydrometer. If the specific gravity of the solution is above 1.270, there will be no danger of the acid solution freezing. If, however, the specific gravity is below 1.270, the battery should be removed and charged. Unless the battery is fully charged, or nearly so, it is probable that the acid solution will freeze and cause extensive damage.

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

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

### **Tires**

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

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

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

### **Body and Top**

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

### **Taking Car Out of Storage**

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

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

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

## CHAPTER VIII

### 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
Horsepower (N. A. C. C. rating).....	57.5
Engine number.....	See below
Capacity of gasoline tank.....	25 gals.
Capacity of engine lubricating system.....	10 qts.
Capacity of cooling system.....	7 gals.
Capacity of transmission.....	3 qts.
Capacity of rear axle.....	3 $\frac{1}{4}$ qts.
Wheelbase.....	148 in.
Tires.....	7.50-19
Spark plug setting.....	.025-.028 in.
Contact point setting.....	.014-.018 in.
Generator charging rate, maximum.....	{ 15-20 amps. cold 8-10 amps. hot

### Engine and Unit Assembly Numbers

Each Cadillac V-16 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 left-hand edge of the flange by which the transmission is bolted to the crankcase.

*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 starter, just below the switch.

*Front axle number*—on the upper surface of the right-hand spring pad, just outside of the car spring.

*Rear axle number*—on the rear surface of the axle housing just 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.

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CADILLAC

~~Shop Manual~~ Shop Manual

Service Information

1930- Cadillac V-16

Series 452

# CADILLAC V-16

## SERVICE INFORMATION

Series 452



March, 1930

*Service Department*  
CADILLAC MOTOR CAR COMPANY  
DETROIT, MICHIGAN

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# Cadillac V-16

## Service Information

### Front Axles

The front axle is similar to the Cadillac 353 front axle, but is not fully interchangeable with it because the shock absorbers are attached under the spring seat on the V-16 instead of through a hole in the axle. With this exception all front axle service operations and adjustments are the same as on the 353.

The rear axle is interchangeable with the Cadillac 353 rear axle except as to gear ratios. The following gear ratios are furnished on the Cadillac V-16: 3.47 to 1, 4.07 to 1, 4.39 to 1 and 4.75 to 1. The 4.75 to 1 ratio is not recommended except for the 7-passenger cars, and then only

in cities where steep hills must be negotiated in traffic. The 3.47 to 1 ratio should be used on the 2-passenger Roadster and then only when top speeds are desired.

Although the rear axle shafts are interchangeable with the Cadillac 353 axle shafts, they are of a special steel. Cadillac 353 shafts must not, therefore, be used in the V-16. The V-16 shafts may be identified by the number 3250 stamped on the outer end.

The torque tube and drive shaft are not interchangeable with the corresponding Cadillac 353 parts as they are 1-1/16" shorter.

### Brakes

The brakes on the V-16 are the same as on the Cadillac 353 with the exception of the vacuum brake assister. The assister does not affect the adjustments of the brakes or of the brake connections up to the pedal.

#### Brake Assister

The assister is connected at the rear end to the center cross member of the frame and at the front end to a lever on the pedal shaft, as shown in Fig. 1. The assister is connected to the two intake manifolds which furnish 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 valves being regulated by the movement of the pedal itself. The assister develops power only as long as the driver continues to push on the pedal. As soon as the driver ceases to push on the pedal, the assister ceases to build up any force and merely holds the position which has been reached. The assister releases automatically when the driver removes his foot from the pedal.

**Assister Mechanism:** The relative position of the brake assister parts is shown in Fig. 2. The

inner flange of the rubber diaphragm is held between the piston and the retainer, while the outer flange is attached to the assister housing

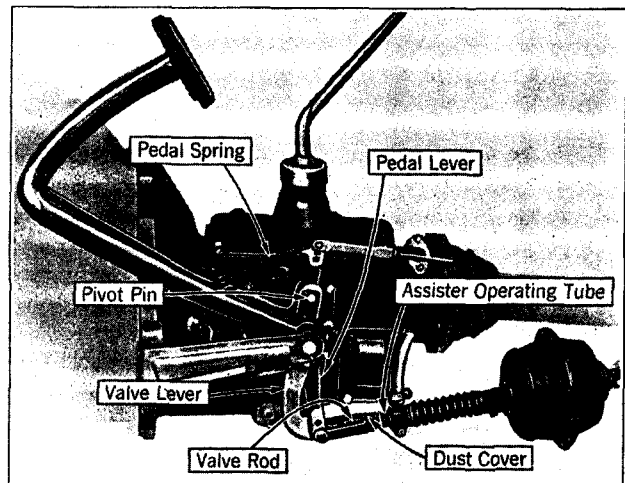


Fig. 1. The Vacuum Brake Assister.

between the housing flanges. Thus the diaphragm divides the housing into two chambers: the front, or air chamber, which is open to the atmosphere through the openings back of the shield; and the rear, or vacuum chamber, which is open to the front chamber through a set of



three atmospheric valves shown in Fig. 3 and to the intake manifold vacuum line through the vacuum valve at the inner end of the hollow assister operating tube as shown in Fig. 4.

The assister operating tube has two cylinders; the inner cylinder which houses the valve rod and the outer cylinder which forms the pas-

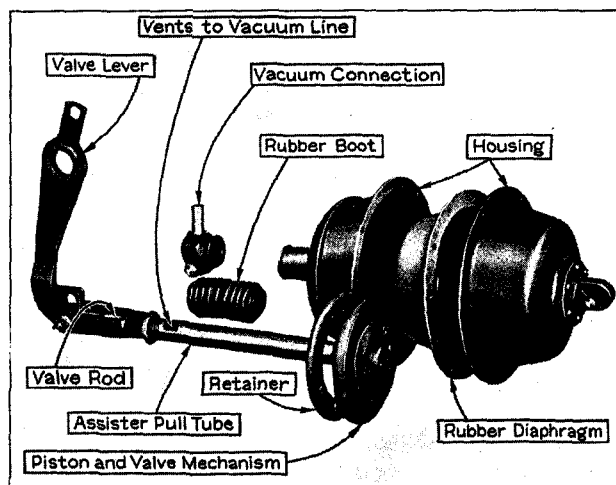


Fig. 2. Exploded view of the brake assister mechanism.

sage for the vacuum between the vacuum line and the assister vacuum chamber. The operating tube of course also connects the piston mechanically to the pedal lever so as to transmit the braking force developed by the diaphragm to the pedal lever.

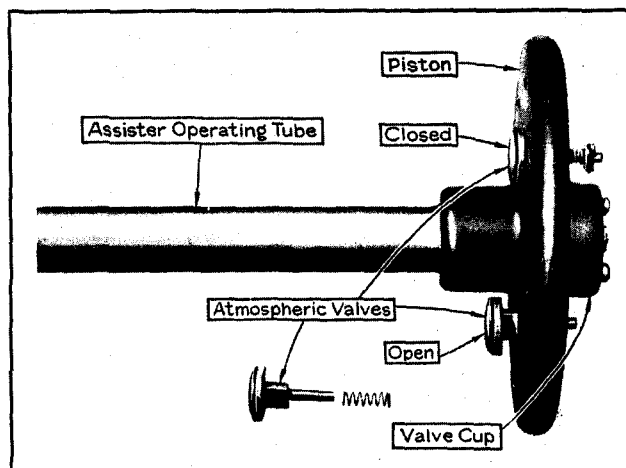


Fig. 3. The atmospheric valves are shown in the open and closed positions.

The atmospheric valves as well as the vacuum valve are controlled by the valve cup carried on the end of the valve rod. See Figs. 3 and 4.

There are three atmospheric valves in the piston which control the passages between the vacuum chamber and the atmosphere. These valves are held against their seats by springs at the back of the valve cup.

The vacuum valve consists of a sliding sleeve on the inner end of the assister operating tube.

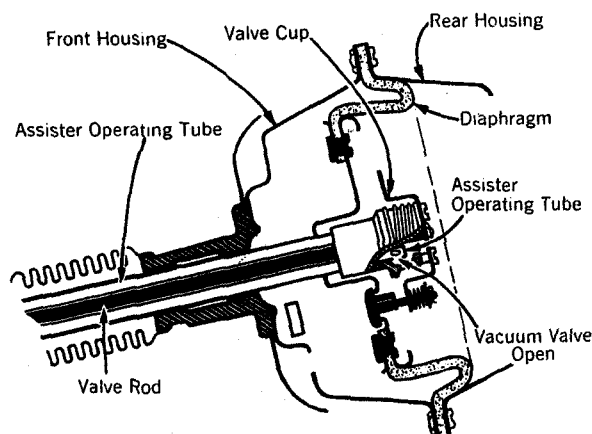


Fig. 4. Sectional view of the assister valve mechanism.

The valve seat is formed by the end of the tube and the vacuum valve is counterbored to provide a passage from the holes in the side of the tube near the valve seat into the vacuum chamber. The construction of the vacuum valve and operating tube are illustrated in Figure 4. The vacuum valve is operated by the valve cup to which it is attached by three clearance screws.

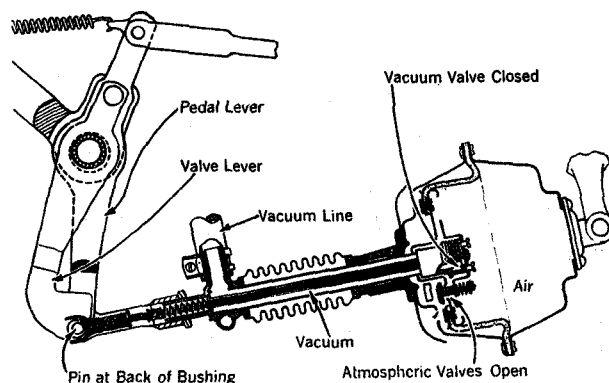
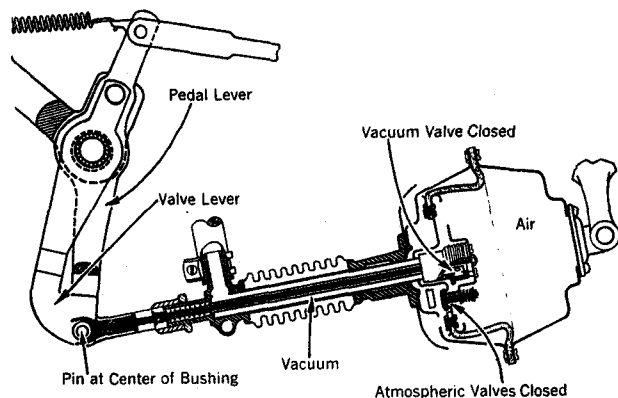


Fig. 5. Brake assister in normal released position. The vacuum valve is closed and the atmospheric valves are open. The pressure on both sides of the diaphragm is equal.

In operation the vacuum valve is never open at the same time that the atmospheric valves are open: the vacuum valve being open at the extreme backward position of the rod and cup while the atmospheric valves are open at the extreme forward position. All the valves are closed when the rod and cup are in the middle position.

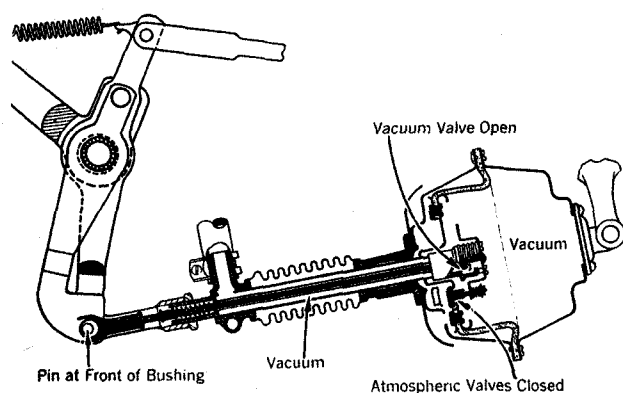
The action of the valve rod is controlled by the valve lever attached to the brake pedal while the pedal lever which is attached to the clevis on the end of the assister operating tube is pivoted as shown in Fig. 1, on a pin in the pedal above the pedal shaft. The pedal shaft hole in this lever is larger than the shaft bearing, thus allowing the slight backward and forward motion necessary at the bottom of the pedal lever, to insure proper valve action.

**Assister Operation:** Figures 5 to 10 show the various stages in the operation of the vacuum brake assister. In Fig. 5, the brakes are in the released position. It will be seen that the valve rod is all the way forward with relation to the piston and in this position, the vacuum valve is closed and the atmospheric valves are open.



**Fig. 6.** The brake pedal has been depressed just enough to close the atmospheric valves. The pressure on both sides of the diaphragm is still equal.

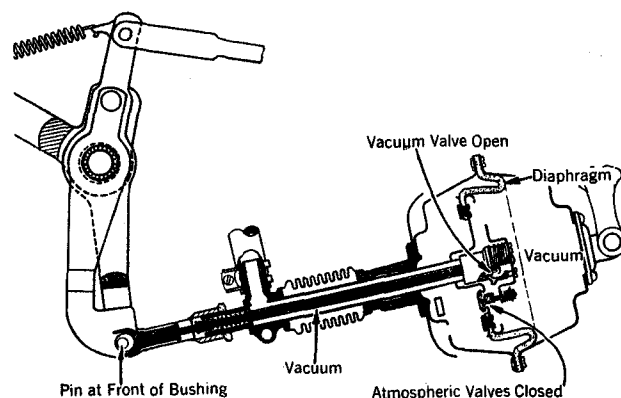
In Figure 6, the pedal has been depressed only enough to push the valve rod and cup back to a point midway in their free travel, closing the atmospheric valves but not yet opening the vacuum valve. There is therefore, no passage between the vacuum chamber and the intake vacuum line.



**Fig. 7.** Further pedal depression has opened the vacuum valve.

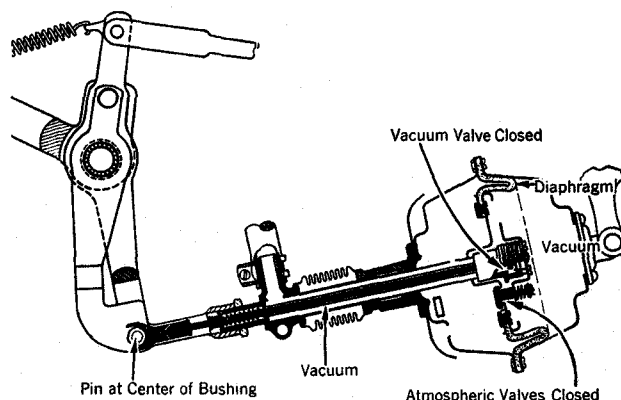
In Figure 7, a slight additional pedal movement has pushed the valve rod and cup back the rest of the way and has opened the vacuum valve thereby opening the vacuum chamber to the intake vacuum line. In Figure 8, the diaphragm has been drawn back by the vacuum to assist the pedal in making a partial application of the brakes. Further depression of the pedal by the operator keeps the intake valve open until, in Figure 9, the operator has applied the desired braking force and pedal movement has ceased, thus closing the vacuum valve.

The atmospheric valve also remains closed until the pedal is allowed to return to its normal



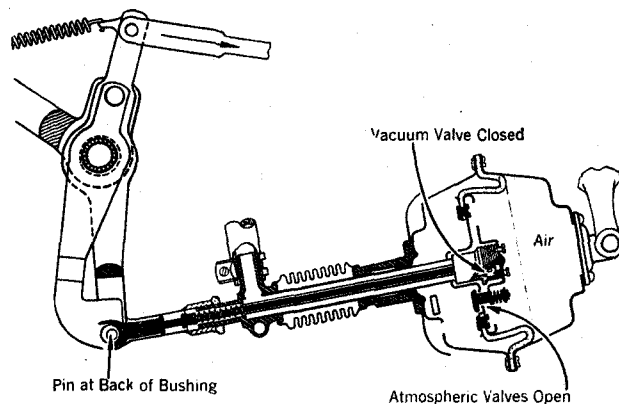
**Fig. 8.** The intake vacuum has drawn the diaphragm back. The pedal is still moving downward so as to keep the vacuum valve open.

position. With all valves closed, the assister ceases to build up force and simply exerts a sustained braking effort as long as the pedal remains stationary.



**Fig. 9.** The pedal movement has ceased allowing the vacuum valve to close automatically, holding the diaphragm stationary.

In Figure 10, the operator has removed his foot from the pedal. This allows the valve rod and cup to be pulled all the way forward by the action of the pedal spring and the brake retract-



**Fig. 10.** The pedal has been released allowing the atmospheric valves to open. This equalizes the pressure on the diaphragm allowing the pedal to return to its normal released position.

ing springs. This forward motion has opened the atmospheric valves so that the pressure on both sides of the diaphragm is equalized, allowing the brake retracting springs to pull the pedal and diaphragm back to the normal released position as shown in Figure 5.

### Brake Adjustments

To make a complete adjustment of the brakes proceed as follows:

Disconnect the brake pull rod and the assister from the pedal lever. See that pedal spring (Part No. 882692) is connected to both the brake pedal and the upper end of the pedal lever. Then adjust the brakes, the pull rods and the cables the same as on the 353. Also adjust the pedal stop screw to give the proper clearance under the toe-board the same as on the 353.

Adjust the clevis on the assister operating tube so that the center of the clevis hole is from  $\frac{1}{8}$ " to  $\frac{1}{4}$ " ahead of the center of the hole in the pedal lever, when the pedal is held up against the stop and the pull tube is drawn as far forward as possible so that the piston bottoms, metal to metal, on the inside of the housing. This is necessary to permit proper valve action.

Before connecting the assister to the pedal lever, place the pin in the clevis and adjust the valve rod (inner rod) until the yoke just touches the pin. This may be done by loosening the lock nut on the rod just back of the yoke and turning the rod either by hand or with small pliers. Next, remove the pin and shorten the rod  $\frac{3}{64}$ " by turning the yoke exactly one and one-half turns on the shaft. While doing this the rod must be held tight to keep it from turning. This gives the proper setting of the valve rod. The brake assister can then be re-connected to the pedal lever. Be sure these parts are free from dirt before hooking up the dust boot.

Next, connect the brake pull rod to the top hole in the pedal lever. The adjustment of the clevis on the pull rod differs from the adjustment on the Cadillac 353 in that  $\frac{1}{32}$ " play should be allowed between the pin and the front end of the slot in the clevis. This clearance is necessary to prevent interference with the valve action of the assister.

Check the brake assister adjustment by depressing the brake pedal slowly and noting the action at the lower end of the valve lever. There should be  $\frac{5}{32}$ " to  $\frac{3}{16}$ " forward and backward movement of the valve lever while the pedal lever is stationary.

## Clutch

The clutch is similar to the Cadillac 353 clutch but is not interchangeable with it, because of its heavier construction.

All V-16 clutch assemblies and driven discs furnished by the Parts Division may be identified by two  $\frac{1}{2}$ " holes punched in opposite slots in the driven discs. (See Fig. 11.) These identification holes are clearly discernible under the edge of the driving plates although they are partially hidden by them.

All service operations on the clutch are the same as those on the 353. If any parts of the clutch other than the driven discs require replacement, a complete new clutch should be installed.

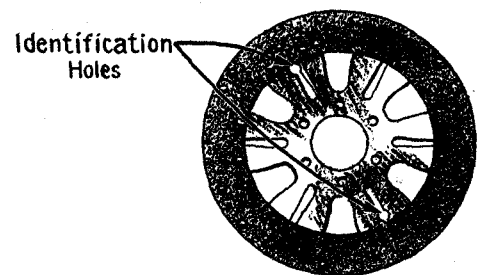


Fig. 11. The V-16 clutch discs have two  $\frac{1}{2}$  in. holes as shown.

## Cooling System

### Radiator

The radiator core is similar in construction to the Cadillac 353 but is not interchangeable with it. The mounting differs in that the starting crank extension and bracket are also carried on the front cross member. If the radiator must be removed it is also necessary to take off the starting crank extension. After the radiator has been taken off the starting crank extension and its bracket can be easily slipped out of the lower part of the radiator.

When re-installing the radiator be sure to put the spacer in place on the cross member so that the starting crank extension will be in proper

alignment with the crankshaft. The starting crank extension must be slipped into place at the bottom of the radiator before the radiator is set in position on the cross member.

The construction of the radiator shutters and automatic shutter control is also similar to that on the Cadillac 353, and the thermostats are interchangeable.

The chromium-plated screen mounted in front of the radiator can be removed by unhooking the pulls at the sides and lifting it up.

The capacity of the entire cooling system is seven gallons.

## Water Pump

The water pump is mounted on the right-hand side of the crankcase toward the rear and is driven from the generator through an extension shaft with flexible couplings. See Fig. 12.

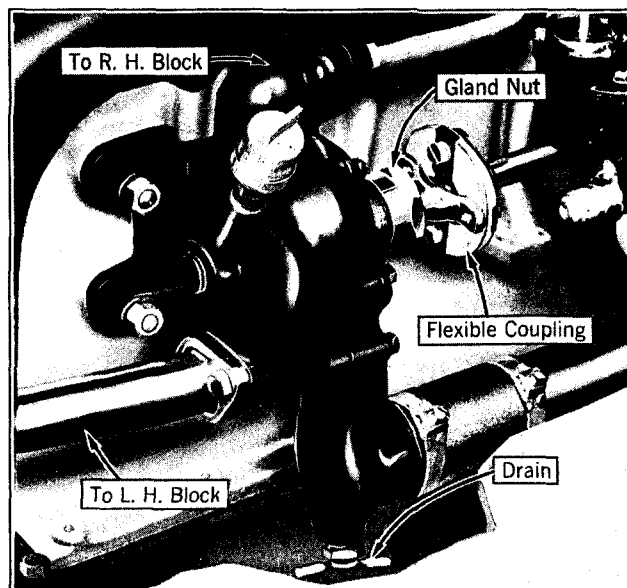


Fig. 12. The water pump is on the right hand side of the engine.

The pump is a double outlet type with the front outlet connected to the R. H. cylinder block and the rear outlet connected to the L. H. block through the cross tube at the rear of the crankcase.

The packing gland nut is easily accessible for tightening with an ordinary open-end wrench.

To remove the water pump, simply disconnect the outlet connections at the flanges on the pump. Disconnect the drive shaft from the pump shaft, and disconnect the hose at the bottom pump connection. Remove the two nuts holding the pump to the crankcase.

The drain for the entire cooling system is at the bottom of the inlet on the pump.

## Condenser

The cooling system includes a condenser tank that reduces the amount of cooling liquid lost through evaporation. This condenser is fastened to the right-hand frame side bar just ahead of the battery as shown in Fig. 13, and is connected to the radiator overflow pipe at the lower right-hand corner of the radiator.

The condenser tank will not operate unless the radiator cap is tight enough to prevent air leaks. When filling the cooling system with anti-freeze solution, the water in the condenser tank should first be drained by removing the plug at the bottom.

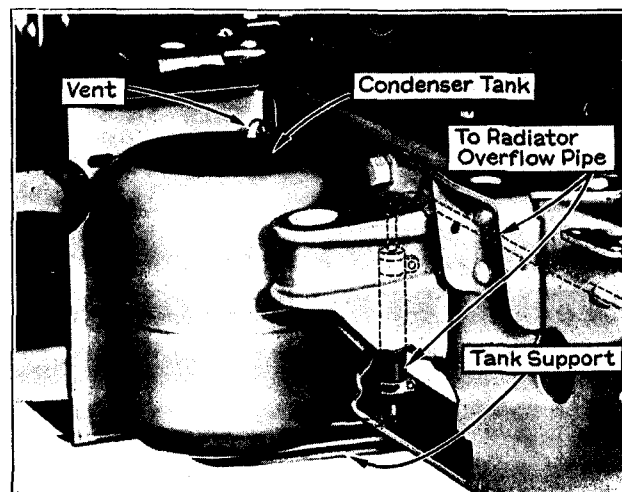


Fig. 13. The condenser tank is connected to the radiator over-flow pipe.

## Fan

The fan turns on two annular ball bearings packed with grease. Lubricate these bearings every 6,000 miles with G-11 chassis lubricant applied through the nipple on the fan shaft.

The fan belt should have the same amount of slack as on the Cadillac 353, and it is adjusted by loosening the nut on the fan shaft and raising the fan to the desired position.

## Electrical System

### Generator

**Caution:** On the first cars shipped, do not under any circumstances loosen the generator mounting nuts without first blocking the sprocket support. If this is not done, the automatic adjustment will be rendered inoperative and it will be necessary to remove the radiator and front cover in order to reset it. See explanation in "Timing Chain Adjustment" section.

The generator is of the same type as the Cadillac 353 generator and has the same thermostatic control. It is driven through a laminated spring driver by the camshaft chain, which has both an automatic and a manual adjustment, as described in the Engine section under "Timing Chain Adjustment." The

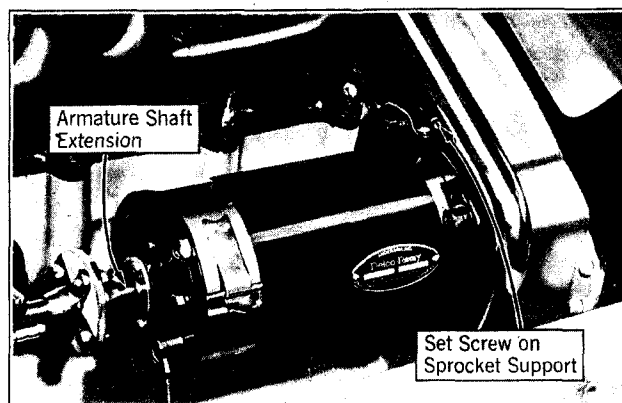


Fig. 14. The generator sprocket support is between the generator and the chain housing.

armature shaft extends through the housing at the commutator end, as shown in Fig. 14, and carries the coupling for the water pump drive shaft. If the springs in the generator driver should ever need replacement, it will be necessary to remove the front cover as directed under "Timing Chain Adjustment."

The generator cut-out is not mounted in the customary position on the generator, but is located on the right-hand body sill under the toe-board and just back of the dash, and is accessible from the engine side of the dash.

### Horns

There are two horns used on the V-16. These horns are adjusted at the factory in matched pairs. For the present no attempt should be made to adjust or service these horns. If it should be necessary to remove either horn, the other should be removed also and another matched pair installed. Matched horns may be distinguished by their numbers, since both horns of a pair bear the same number.

As the amount of current required to properly operate both horns is greater than that required

on the 353 horn circuit, where only one horn is used, heavier wires are necessary to insure sufficient voltage at the horn terminals so that the horns will give the tones for which they were originally adjusted. If difficulty is ever encountered with the tone or proper operation of the horn, make sure that the latest type of wiring is installed before replacing the horns.

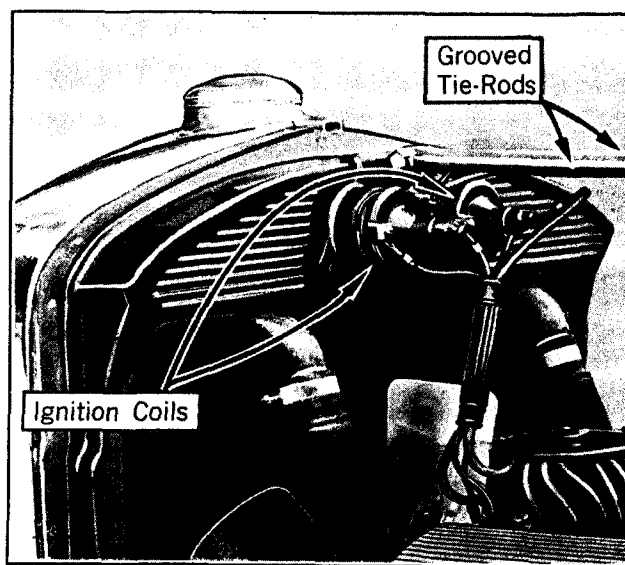


Fig. 15. The ignition coil negative terminals are connected together.

### Ignition:

The ignition system is entirely new and consists of two almost entirely separate circuits controlled by the same switch. Each circuit has a separate coil, timer contact points, condenser, and a separate set of distributor terminals. One circuit provides ignition for the right-hand cylinders, the other for the left-hand cylinders.

**Ignition Coils:** The two ignition coils are mounted in recesses in the upper tank of the radiator, where they are protected from moisture and excessive heat. See Fig. 15. The feed wire from the switch is brought forward in the grooved left-hand radiator tie rod and is connected to the negative side of the coils. From this point the two circuits are entirely separate.

If it should ever be necessary to remove the ignition coils, take out the bracket clamp screw between the coils. Drive a cold chisel into the slot in the bracket to spread it so that the coils and bushings can be pulled out. Be sure the bushings are put back with their diagonal edges parallel when re-installing the coils.

**Firing Order:** The cylinders are not numbered according to the same system as previously used on Cadillac cars. The cylinders of the V-16

are numbered according to location rather than firing order. The numbering system is as follows:

R. H. 2-4-6-8-10-12-14-16.

Front

L. H. 1-3-5-7-9-11-13-15.

The firing order is as follows:

1-8-9-14-3-6-11-2-15-10-7-4-13-12-5-16.

This firing order is given on the top of the distributor cap. The numbers refer to the numbers as stamped on the cylinder blocks below the spark plugs. The locations of the numbers in the firing order diagram are not intended to correspond to the location of the cylinders.

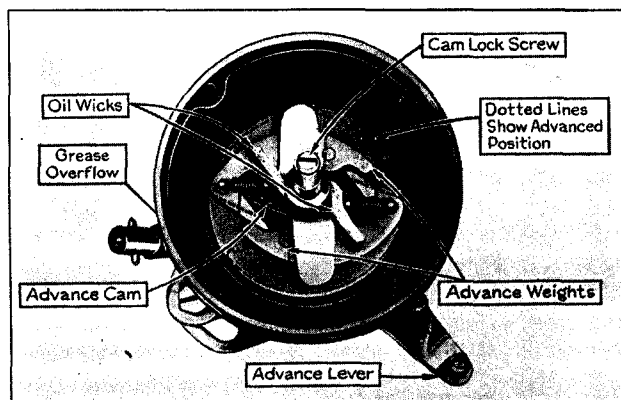


Fig. 16. An improved type of automatic advance mechanism is used on the V-16.

**Spark Control:** The automatic spark control mechanism is different from the Cadillac 353 and is shown in Fig. 16. The manual control is also different, being controlled by a rod and a rocker arm mounted on the dash, as shown in Fig. 44. When the spark control button on the rod at the instrument panel is all the way in, the spark is advanced. To retard the spark, simply pull this button out the desired distance.

The automatic control range is  $24^\circ$ , and the manual is  $38^\circ$ , measured on the flywheel. The IG/A marks on the flywheel are  $1\frac{1}{4}''$  ahead of center.

**Spark Plugs:** The spark plugs and wires are concealed by the cover plate over the "V" between the cylinder blocks, and are easily accessible for inspection by removing the two knurled hand nuts. See Fig. 17. The AC type G-10 spark plugs should be used in the V-16, the same as in the 353. The standard spark plug gap adjustment is the same—.025" to .028".

**Timer Distributor:** The distributor is of the same general type as the Cadillac 353 distributor, but is larger and designed to furnish ignition for sixteen cylinders rather than for eight cylinders. There are two sets of timer contact points, both contact arms being operated by a single eight-lobe cam. Each set of points has its own condenser mounted inside the distributor. Fig. 18 shows the arrangement of the breaker mechanism.

The contact arms operate alternately and are mounted at an angle of  $22\frac{1}{2}^\circ$ . The right-hand contact arm and the left-hand coil furnish ignition for the left-hand or odd-numbered cylinders. This arm

pivots on the stationary post and is timed by turning the cam the same as in timing the odd-numbered cylinders on the Cadillac 353. The left-hand arm and right-hand coil furnish ignition for the right-

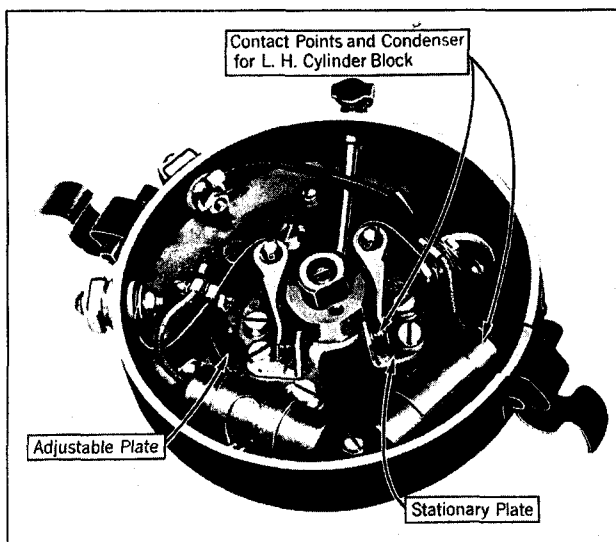


Fig. 18. The right hand contact points and the left hand coil fire the left hand cylinders.

hand or even-numbered cylinders. This arm pivots on a post anchored to an adjustable plate and is timed by an eccentric adjustment which must be synchronized with the other arm the same as on the Cadillac 353.

The high-tension distributor has 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. See Fig. 19. The end which takes care of the right-hand cylinders is connected to a contact in the center of the

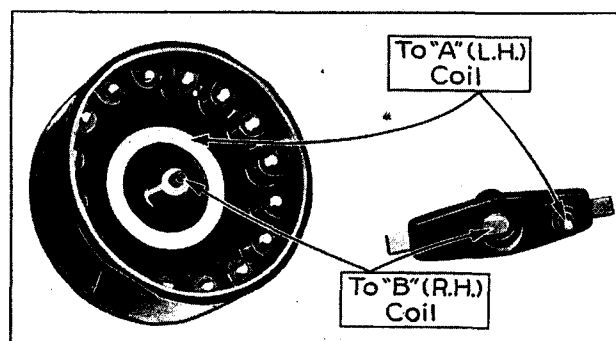


Fig. 19. The separate high tension circuits are distributed by a special rotor.

rotor, which in turn is continually in contact with a brush in the center of the distributor head. The end of the rotor which provides for the left-hand cylinders is connected to a brush making continual contact with a ring in the distributor head. This ring is connected to a separate terminal in the head.

All high-tension connections at the distributor are of the prong type, and each post is plainly marked to show to which cylinder or coil it should be connected. When reconnecting coil wires, remember that the "A" coil is at the left and the "B" coil is

at the right. The coil and spark plug leads are carried in two layers or decks of nine each, which are separated at the edge by a dividing ring. The arrangement of the wires in the lower deck is shown in Fig. 20. The outside of the distributor cover shows the cylinder numbers of the wires in each deck and the order in which they should be connected.

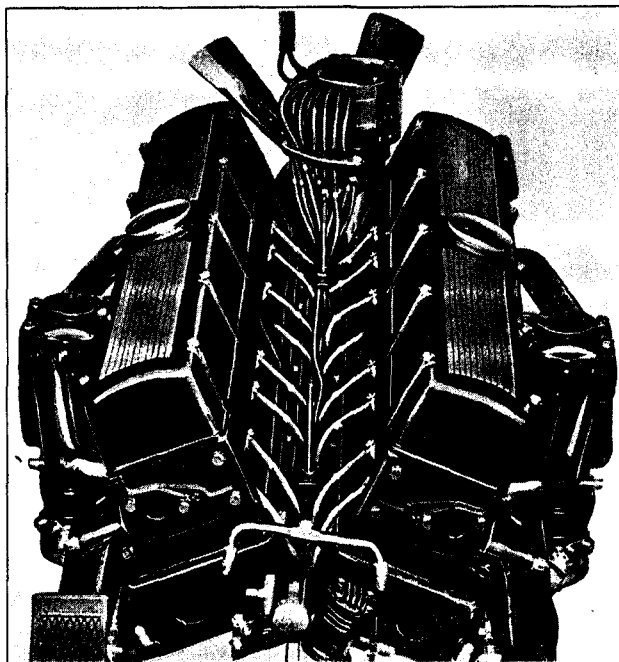


Fig. 17. The numbers at the ends of the spark plug wires correspond to the cylinder numbers stamped below the spark plug holes.

**Adjustment of Contact Point Gap:** The gap between the timer contact points is adjusted by an eccentric post in the same manner as on the Cadillac 353. The amount of the gap, however, is not the same—the contact points on the V-16 should be adjusted to a gap of .014" to .018".

**Timing Ignition:** The method of timing the ignition is in general the same as on the Cadillac 353. The point at which the contacts should separate, when the manual control is at full advance, is indicated on the flywheel by the marking IG/A. There are two IG/A marks, one for the Nos. 1 and 15 cylinders, shown in Fig. 21, and the other for the Nos. 8 and 10 cylinders. These IG/A marks are  $1\frac{1}{4}$ " ahead of center.

After the contacts have been adjusted for the proper gap, they should be checked for synchronization. The synchronizing fixture, Tool No. 109224-T, can be adapted for the V-16 timer by notching the protractor plate exactly half way between two of the points now used for the eight cylinder distributors. This is necessary because the V-16 cylinders are at 45° instead of 90°.

Both the contact gap and the synchronizing adjustments are made in the same manner as on the 353.

After synchronization, time the odd-numbered cylinders (left-hand) by turning the flywheel to the 1-15 IG/A mark and adjusting the timer cam so that the fixed or **right-hand** set of contacts just separate when the IG/A mark is opposite the

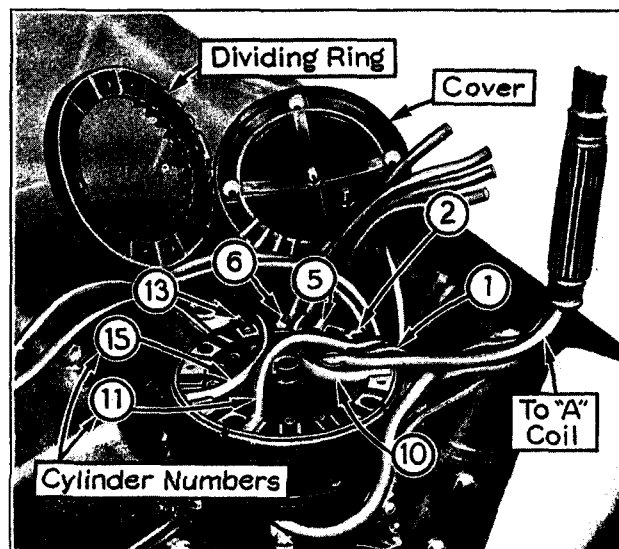


Fig. 20. The high tension connections at the distributor are marked on the cover.

indicator and the breaker-mechanism is in the fully advanced position. A test lamp, connected between the low-tension terminal of the contacts being timed and ground, should be used for the synchronizing as well as the timing operation.

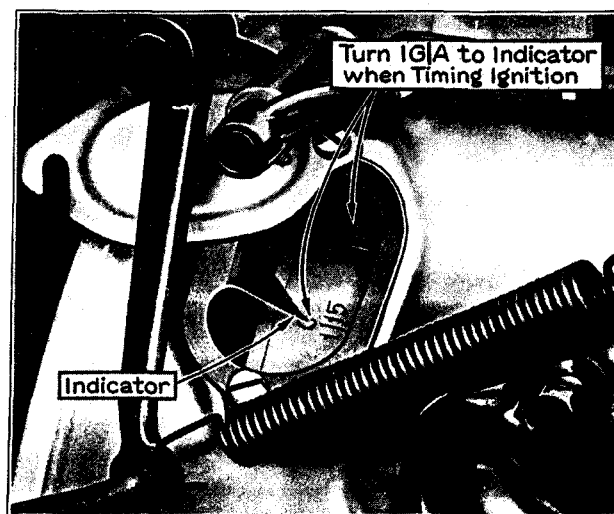


Fig. 21. The IG/A mark is  $1\frac{1}{4}$  in. ahead of center.

Be sure that the spark control rod is adjusted so that the stop screw is at the extreme right-hand end of the slot in the advance quadrant when the control button on the instrument board is pushed all the way in.

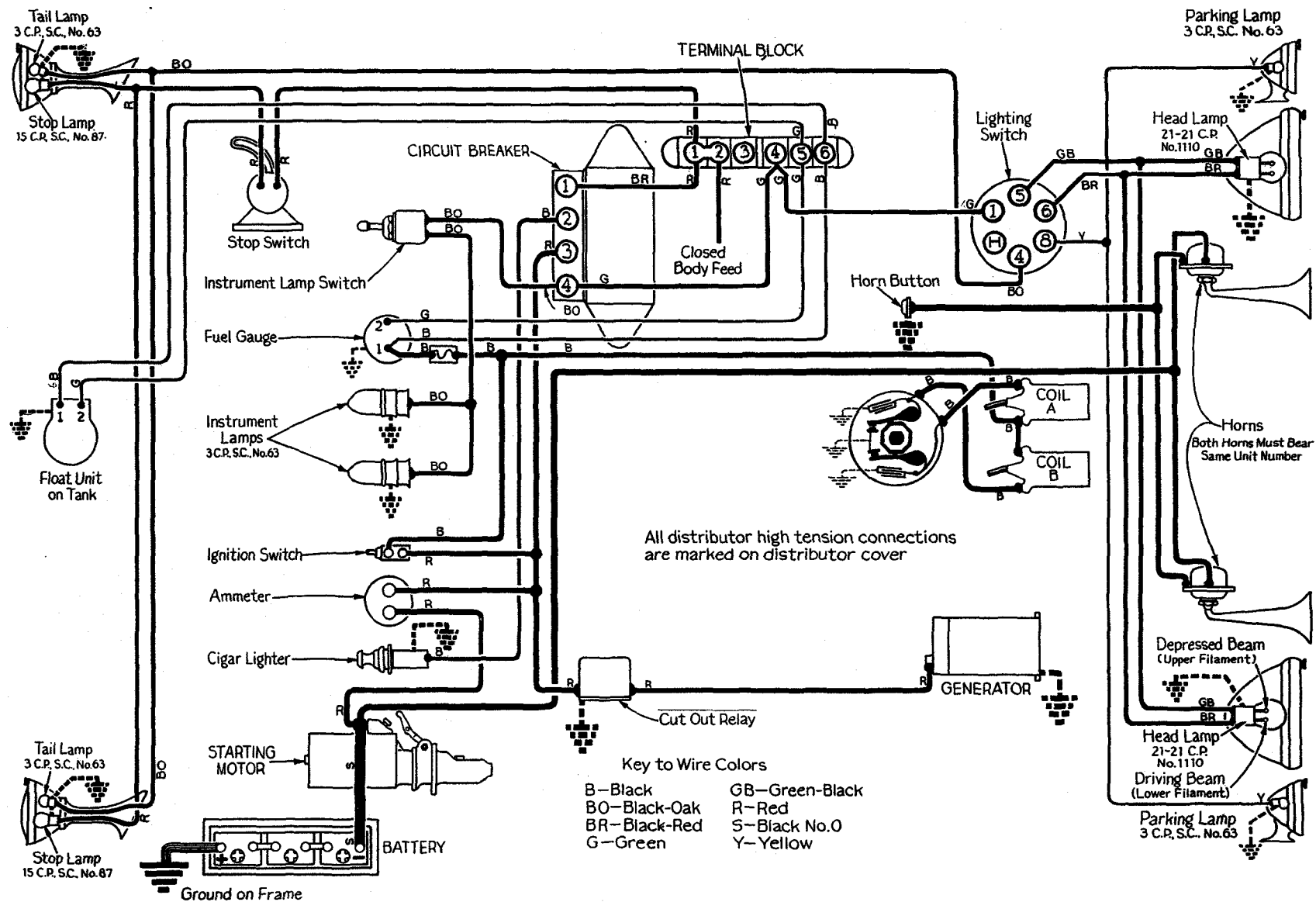


Fig. 22. Wiring diagram for the Cadillac V-16. Some of the connections at the terminal block on the first cars shipped were not made as shown above. These differences are described under "Wiring."



## Starting Motor

The starting motor and reduction gears are of the same type as used on the Cadillac 353, but the motor is larger and has six poles. The reduction gears also have a different ratio, so that the total reduction between the armature shaft and the flywheel is approximately 21 to 1.

## Storage Battery

The storage battery is a special twenty-one plate Exide battery. The outside dimensions of this battery are the same as on the Cadillac 353 and care must be taken not to mistake one for the other. The V-16 battery can be readily identified by the manufacturer's type number, 3-XC-RV-21-2-G, stamped on one of the connector straps.

The 353 battery should not be used on the V-16 except temporarily in case of an emergency.

## Wiring

The general arrangement of the chassis wiring is similar to the 353, except the ignition circuit and the horn circuit.

The primary lead from the ignition switch to the coils is not carried through the terminal block on the dash but goes directly to the coils, being concealed in the groove of the left-hand radiator tie rod.

The feed wire for the horn circuit is connected to the starting switch. It is carried in a flexible conduit to the junction box at the left side of the frame, and thence to the horns.

(On some of the first cars shipped the connections at the terminal block on the dash are not as shown on the diagram in Fig. 22. On these cars the body feed wire was connected to No. 1 on the terminal block; the wire from No. 4 on the circuit breaker was connected to No. 2 on the terminal block and the fuel gauge wires were connected to Nos. 4 and 5 instead of Nos. 5 and 6.)

# Engine

## Engine Supports

The engine is mounted in rubber at six points as follows: 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.

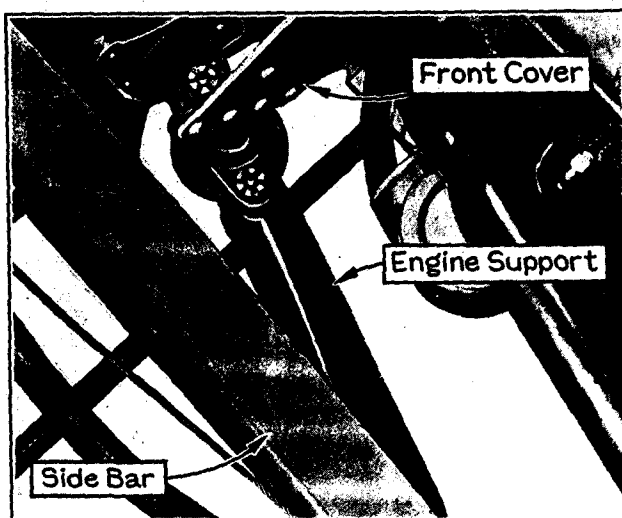


Fig. 23. The front engine supports also form the rear bracket for the front spring.

The supports at the rear of the crankcase are the same as on the Cadillac 353. The support brackets at the front end of the engine are at the sides of the front cover and rest on the engine supports (shown in Fig. 23) running diagonally from the side bars to the radiator cross member. The supports at the rear of the transmission are attached to the center cross member and are illustrated and described in detail under "Transmission."

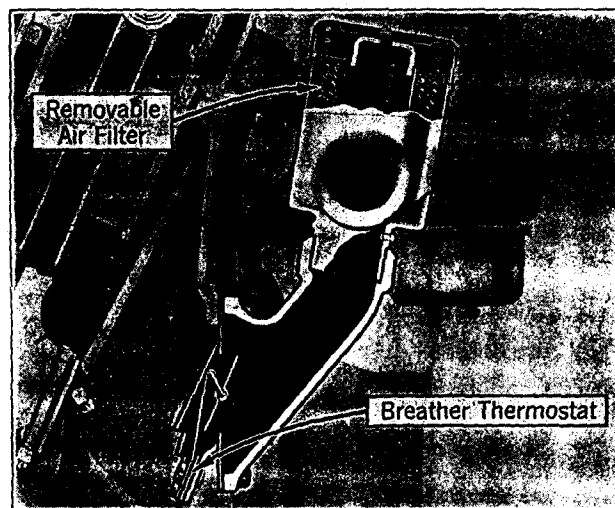


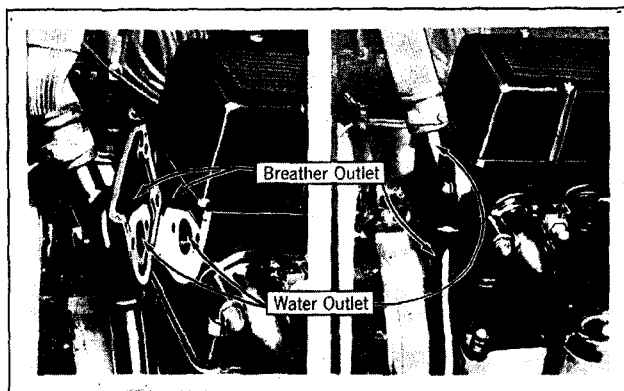
Fig. 24. Remove the ventilator intake from the crankcase before taking out the screen.

## Crankcase Ventilator

The intake for the crankcase ventilating system is mounted on the left of the crankcase near the front as shown in Fig. 24. A screen is provided to filter the air and prevent particles of dust and dirt from entering the crankcase. This screen should be removed and cleaned about every 6,000 miles. To take out the screen, remove the four cap screws holding the intake to the crankcase and lift off the intake assembly. The screen is held in place by the cap at the top of the intake and can be lifted out after this cap has been removed.

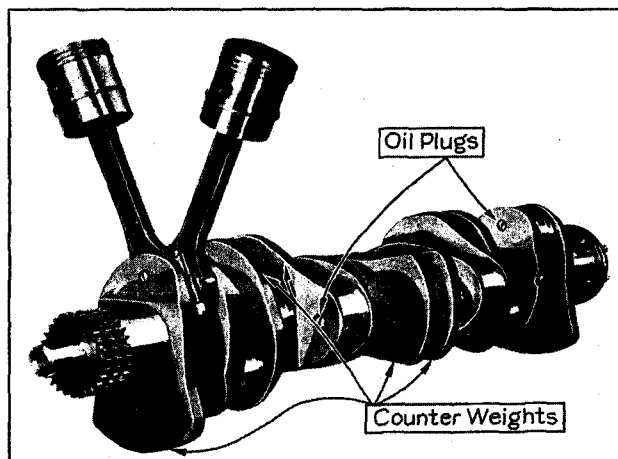
The screen may be cleaned by washing it in gasoline. Before re-installing, it should be immersed in engine oil until it is thoroughly saturated.

The intake is provided with a thermostatically controlled shutter as shown in the illustration. This shutter closes automatically at higher engine temperature.



*Fig. 25. The combination fittings at the front of each cylinder head forms an outlet for the cooling liquid as well as the crankcase ventilating system.*

The air taken into the crankcase through this intake circulates through the crankcase, passing up to the valve mechanism through the space around the cam slides carrying the water and the gasoline vapors out through the ventilator outlet pipes attached to the front of the cylinder head castings. The fitting on the cylinder head to which this pipe is attached is a combination water and ventilator outlet, the upper outlet pipe providing the return for the cooling liquid to the radiator while the lower outlet carries the crankcase vapors down below the mud pans. See Fig. 25.



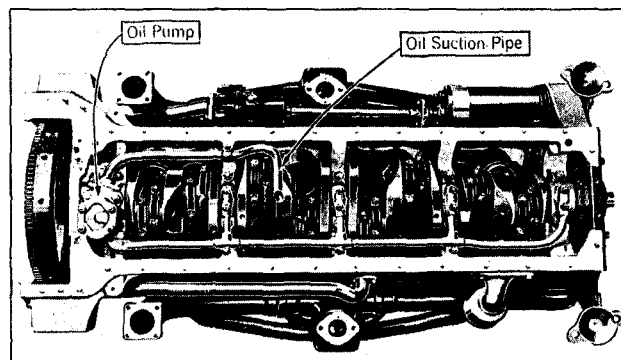
*Fig. 26. The crankshaft has eight throws and five main bearings.*

## Crankshaft, Connecting Rods and Pistons

**Crankshaft and Main Bearings:** The crankshaft has five main bearings,  $2\frac{5}{8}$  inches in diameter, which are of the same steel-backed interchangeable type as used on the Cadillac 353. The end thrust, however, is taken by the center main bearing instead of the rear bearing. The rear bearing cap carries the oil pump and like the 353, has two wooden plugs

to seal the joint between the cap and the crankcase and prevent oil leakage into the flywheel housing. Use tool No. 109619 to remove the rear main bearing cap.

The clearance for new bearings is .001" to .0015". Tools are being developed to indicate the main bearing clearance in the same manner as for the 353. The crankshaft end play should be held to .001" to .005" on new bearing installations.



*Fig. 27. Bottom view of engine with oil pan removed.*

The oil passages in the crankshaft are sealed with screw plugs as shown in Fig. 26. These screws can be removed with an off-set screw-driver, tool No. 109609.

The crankshaft sprocket can be removed with tool No. 109615, crankshaft sprocket puller, after first taking off the front cover as directed under "Timing Chain Adjustment."

**Connecting Rods and Pistons:** The connecting rods are similar to those used on the Cadillac 353, but have different dimensions. The piston pin diameter is  $\frac{3}{4}$ " and the crank pin diameter  $2\frac{1}{2}$ ".

Four piston rings are used as on the 353: three compression rings above the pin and one oil ring below the pin. See Fig. 26.

All service operations on rods and pistons are the same as on the 353. The connecting rod and piston assemblies can be removed through the bottom of the crankcase without taking off the cylinder heads.

The rods must always be installed with the flange side against the crankshaft cheek and the pistons should be installed on the rods so that the piston pin lock screw is on the flanged side of the rod.

**Harmonic Balancer:** A harmonic balancer is used on the front end of the crankshaft to eliminate torsional vibration. The driving member of this balancer is carried on the fanshaft driving pulley. The balancer requires no attention and should be serviced as a unit. To remove the balancer requires a special puller, tool No. 109614.

Two types of balancers have been used. These are fully interchangeable as the only difference is in the provisions made for removing them from the crankshaft. On the earlier type the cover and the ratchet plate are held on by  $\frac{3}{8}$ "

cap screws and the puller bolts are screwed into two of these cover screw holes in the driver when removing the balancer.

On the later type, the cover and the ratchet plate are held in place by  $\frac{1}{2}$ " capscrews, and the  $\frac{3}{8}$ " puller holes are located in the hub behind the driver. These larger holes in the driver provide clearance for the puller bolts which screw into the hub instead of the driver. Tool 109614 will remove either type of balancers.

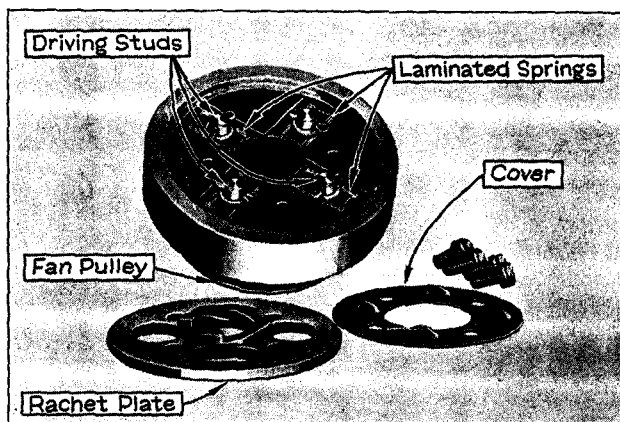


Fig. 28. The harmonic balancer should be serviced as a complete unit.

## Cylinders

**Cylinder Heads:** The cylinder heads are entirely different from the Cadillac 353 cylinder heads, because of the overhead valve construction. They are held in place on the inner edge by long studs extending from the crankcase through the cylinder block. At the outer edge shorter studs in the cylinder block are used. The right and left heads are interchangeable.

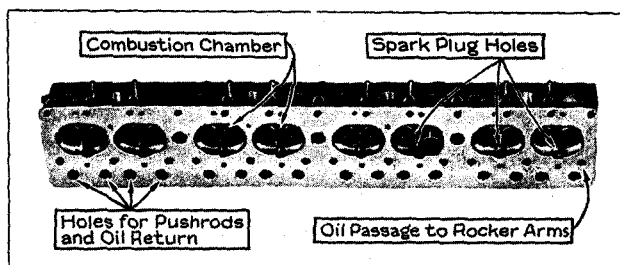


Fig. 29. The cylinder heads contain the overhead valve mechanism.

When taking off the cylinder head for cleaning carbon it is not necessary to remove the valve rocker arms from the head.

To remove a cylinder head for grinding valves, however, it is necessary to remove the valve rocker arm mechanism and the valve silencer dashpots. The valve rocker arms and shaft assemblies are in two sections on each head and can be removed simply by unscrewing the eight nuts attaching each support to the head, and taking out the telescoping oil line between the ends of the shafts. The valve push rods should also be removed before lifting up the head.

Service information on the valve mechanism is found under "Grinding Valves."

**Removal of Exhaust Manifolds and Intake Manifolds:** With the exception of the two studs at the ends of the exhaust manifold, the same studs and nuts serve to hold both intake and exhaust manifolds in place. The intake manifolds may be removed if desired without taking off the exhaust manifolds and carburetors. Disconnect the brake vacuum lines from the manifolds, and take out the four cap screws holding the manifolds together. After removing all the manifold nuts except those at the extreme ends, the intake manifold can be lifted off.

To remove the exhaust manifolds, also disconnect the exhaust pipes and the carburetors from them. Remove the manifold nuts and lift off the manifolds.

When reinstalling, put the exhaust manifold in place first and turn the two end stud nuts up just tight enough to hold it in position while the intake is being installed. Draw all manifold nuts up evenly.

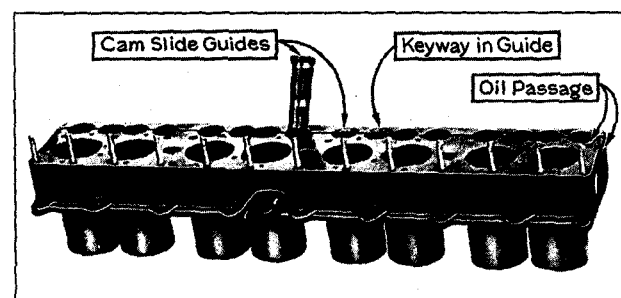


Fig. 30. The cam slide guides are pressed into the cylinder block.

**Cylinder Blocks:** The cylinder blocks are held in place by short studs and nuts on the outer edge and on the inner edge by long studs extending from the crankcase up through the cylinder heads.

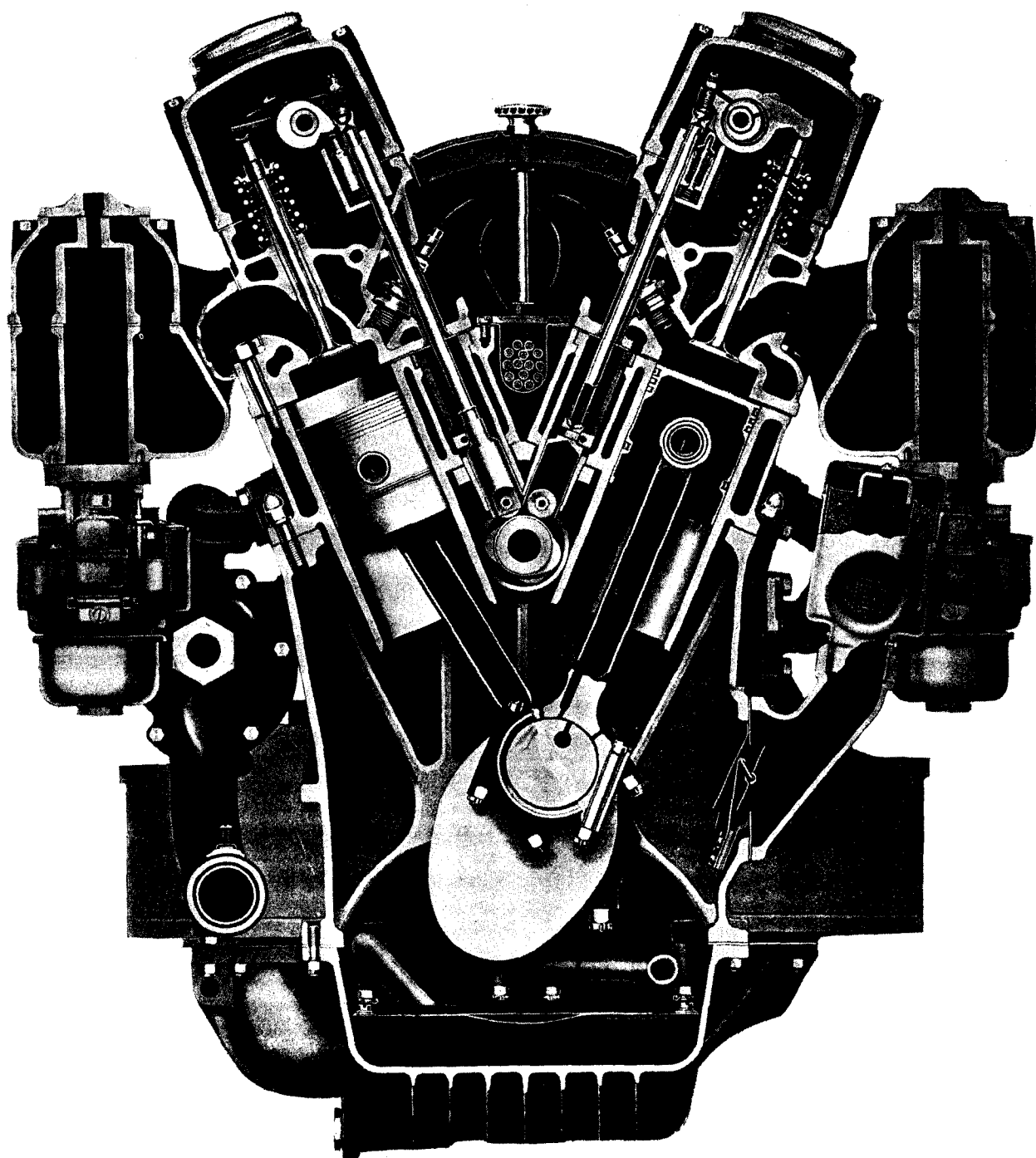
The guides for the cam slides are pressed in the cylinder block. See Fig. 30. A special puller is being developed to remove these guides. The cam slide guides do not form a part of the cylinder block assembly as serviced by the Parts Division. In case of replacement of a cylinder block, the original cam slide guides must be removed and installed in the new block.

The right and left-hand cylinder blocks are interchangeable.

## Cam Shaft and Valves

**Camshaft:** The camshaft has five bearings and is driven by a chain from the crankshaft. A spiral gear at the front end of the camshaft drives the distributor shaft and a similar gear at the rear end drives the oil pump. An eccentric at the extreme rear end of the camshaft operates the vacuum pump in the same manner as on Cadillac 353. The camshaft sprocket is mounted the same as on the 353.

**Cam Slides:** The cam slides (see Fig. 32) are of the same type as on Cadillac 353 and must be



*Fig. 31. Cross-sectional view of the Cadillac V-16 engine.*

served as a unit. They do not, however, carry any adjusting screw, the spherical ends of the push rods resting in sockets in the cam slides.

The cam slides are kept from turning by a key that engages a slot in the cam slide guide. There is a hole in the key in which a bent wire may be inserted to remove the cam slide.

**Overhead Valve Mechanism:** The overhead valve mechanism is provided with automatic valve silencers that automatically maintain prac-

tically zero valve clearance and effectively overcome the objectionable noise usually characteristic of this type of valve.

Each rocker arm is mounted on a flanged eccentric bushing as shown in Fig. 34. A dash pot and plunger are located directly below the flange of this bushing, the plunger bearing against a cam on the flange. Upward pressure of a spring under the plunger keeps the eccentric always in such a position that the rocker arm touches both the valve stem and the push rod.

This pressure is not great enough, however, to hold the valve open.

The dash pot cylinder below the plunger is kept full of oil and this oil prevents the plunger from being forced down as the valve opens and closes. The clearance between the plunger and the cylinder is just enough to let the plunger move downward slowly, to compensate for ex-

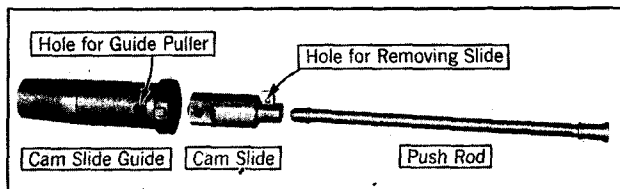


Fig. 32. The cam slides and guides can be removed without taking off the cylinder blocks.

pansion as the engine heats up. A small poppet valve opening downward in the bottom of the plunger allows quick return of the oil to the chamber in the bottom of the dash pot.

The automatic valve silencers are furnished only in assemblies consisting of a dash pot, two plunger assemblies and two plunger springs. The plungers in each assembly are selected for proper clearance and both the plungers and the dash pot are numbered. It is important, therefore, that the plungers always bear the same number as that stamped on the dash pot.

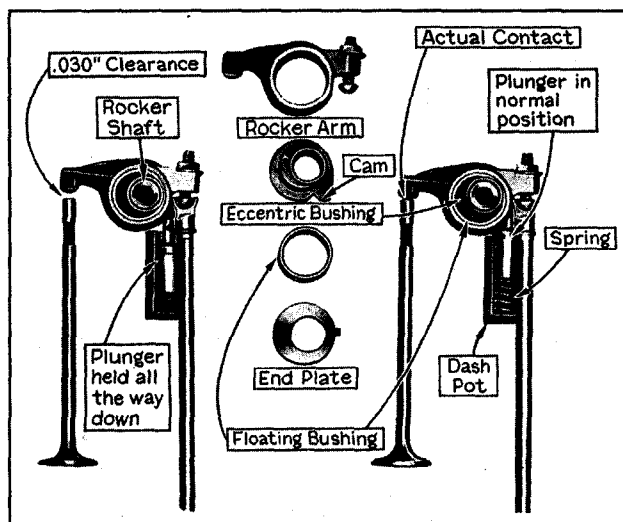


Fig. 34. At the left the plunger is held all the way down to show the clearance. At the right, the plunger has turned the eccentric bushing to take up this clearance.

**Valve Springs:** Two sizes of valve springs have been used on the V-16; those on the earlier cars shipped are slightly smaller than the later type, and only the later type should be used for replacement. These may be identified by the diameter, the later type outer valve spring being approximately 1-7/16" outside diameter and the inner spring being 1" outside diameter. When installing the later type valve springs new valve washers must also be used to take care of the larger sized springs.

In making the valve spring replacements it is not necessary to remove the cylinder head. The valve may be held up against the seat, using Tool No. 109606 inserted through the spark plug hole and Tool No. 109625 for compressing the valve springs.

**Valve Grinding:** After removing the head, the valves can be removed for grinding by using the same valve lifter which has been supplied for previous Cadillac and La Salle cars. Two valve springs are used on each valve to prevent valve chatter at high speeds. These springs should always be installed with the close coils down, or next to the cylinder head.

The angle of the valve seats is 45° for both inlet and exhaust valves and the valves are 1 5/16 inches nominal diameter, taking a different valve seat reamer from any previous Cadillac or La Salle engine. A suitable reamer can be secured from manufacturers of this equipment or we can furnish one under Tool No. 109249 from our Parts Division.

No valve stem adjustment is necessary after grinding valves, unless the original setting has been disturbed. (See under "Valve Mechanism.")

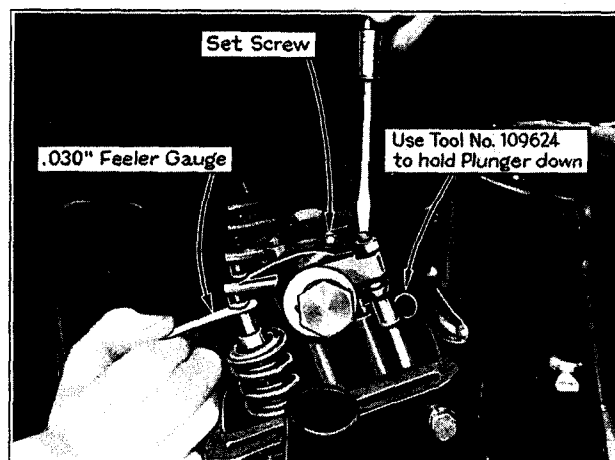


Fig. 33. The valves can be adjusted more easily while the engine is running.

**Valve Adjustment:** As the clearance is automatically held at zero, no valve adjustment in the usual sense of the word is necessary. The automatic silencers take care of all variations due to wear or to valve grinding operations.

There is, however, provision for an initial adjustment to secure the proper position of the eccentric cam and if this adjustment is disturbed, it must be corrected to the proper standard.

To make this adjustment, the silencer plunger must be held down as far as it will go. This can be done by using Plunger Releasing Tool No. 109624, as shown in Fig. 33, in the upper hole of the plunger to release the poppet valve inside the plunger. The eccentric must then be turned so that the cam rests on the plunger while it is thus held down. With the cam and plunger in this position, the adjusting screw in the rocker

arm should be set to allow .030" clearance between the rocker arm and the valve stem. **Important:** The plunger must be held all the way down with the cam resting on it when making this adjustment.

This adjustment can be made either with the engine running or with the engine stationary. If the engine is not running, the piston must be at the firing point for each cylinder, while the adjustment for that cylinder is made. If the engine is running, it is simply necessary to hold the plunger down and check the clearance with the feeler, making adjustments as necessary.

### Front Cover and Timing Chain

**Caution:** On the first cars shipped, do not under any circumstances loosen the generator mounting nuts without first blocking the sprocket support. If this is not done, the automatic chain adjuster will be rendered inoperative and it will be necessary to remove the radiator and front cover in order to reset it. See explanation below.

The V-16 engine has only one timing chain, as the use of an automatic adjuster makes it possible to drive the generator as well as the camshaft with the same chain. This chain is a Morse Duplex, Type 49.

The automatic chain adjuster will take care of all ordinary wear, but a manual adjustment is also provided to take up any additional slack should the limit of the automatic adjustment ever be reached. The mounting holes in the generator sprocket support are slotted to provide for this manual adjustment.

**Automatic Chain Adjuster:** The automatic adjuster is similar in principle to the automatic adjuster with which the first Cadillac 314 cars were equipped. On the V-16, however, the adjustment works on the back of the chain and the idler sprocket moves toward the camshaft to take up the slack. See Fig. 35. The operation of the slide and ratchets is practically the same as on early 314 cars.

On the V-16 the timing chain may be removed by taking off the generator drive sprocket after first blocking the automatic adjuster down in its initial position. Although this ordinarily gives sufficient slack for removal of the sprocket, it may also be necessary to back off the manual adjustment at the generator mounting nuts.

In order to set the automatic adjuster back to its initial position (which is necessary when removing or installing the chain or when taking up the manual adjustment) it is necessary to release the latches by inserting Tool No. 98677 in the holes in the adjuster slide on each side of the slide support.

With this tool in place, the sprocket and slide can be pushed back down to their initial posi-

tions and can be held there by inserting a wooden plug about  $\frac{5}{8}$ " in diameter in the space below the support. If Tool No. 98677 is not available, a pair of straight pointed punches can be used in its place.

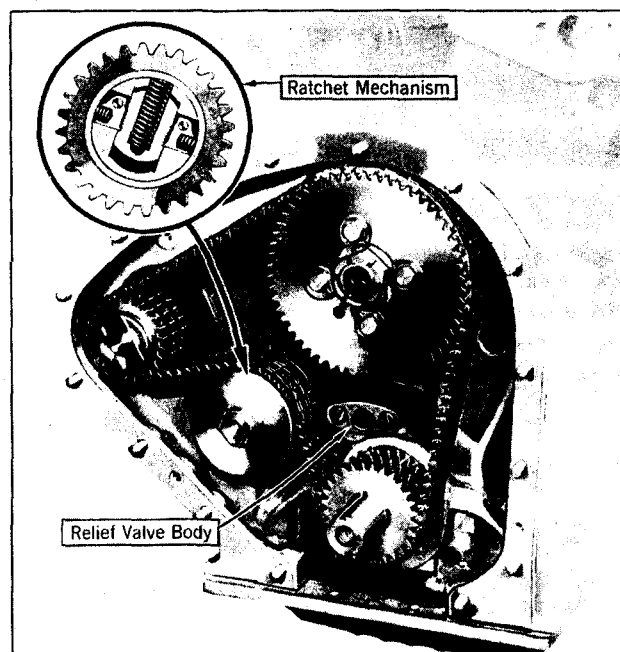


Fig. 35. The timing chain adjustment is automatic.

**Manual Adjustment:** It is quite evident that if the adjustment of the generator sprocket support is disturbed the automatic adjustment will immediately take up the slack which results, and this will thereafter render the automatic adjustment inoperative until it can be reset.

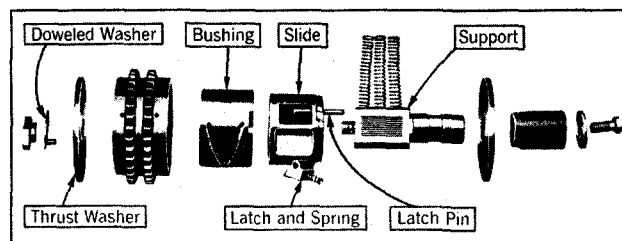


Fig. 36. Exploded view of the automatic chain adjuster.

To prevent this, cars now being shipped are provided with an adjusting screw in the flange of the sprocket support. This screw bears against one of the mounting studs and thereby locks the adjustment so that it is not disturbed when the generator mounting nuts are loosened. Before loosening the nuts, always make sure that this screw is turned in against the stud.

V-16 cars being shipped at the present time have a hole drilled and tapped for a set screw in the generator sprocket support as shown in Fig. 14. Some of the first cars shipped, however, did not have this hole in the support and on these it will be

necessary to insert a block between the support and the crank case before loosening the generator mounting nuts as noted above. On these earlier cars the first type of sprocket support should be replaced with the later type having this set screw hole, at the first time it is necessary to remove the front cover.

Some of the cars with the drilled supports did not have the set screws installed at the factory before delivery. On all of these cars this screw and its lock nut should be put in place and turned up tight against the generator mounting stud. The set screw, part No. 882661, and lock nut, part No. 882662, may be secured from the Parts Division.

On the cars which do not have the drilled support it is important to block the sprocket support by other means before loosening the generator mounting nuts. This can be done easily by placing a tapered block of wood of the proper thickness between the crankcase and the edge of the support. This block should not be removed until after the generator mounting nuts have been tightened again.

If, through failure to observe this caution, the automatic chain adjuster is rendered inoperative, remove the radiator and front cover and release the latches with Tool 98677 as before explained. With the adjuster slide blocked down as far as it will go, move the generator support to take up the slack in the chain, tighten the generator mounting nuts, and then release the automatic adjuster.

**Removal of front cover:** In order to remove the front cover the pressure regulator screw must be taken out and the front of the engine must be jacked up high enough to permit removal of the harmonic balancer. Before doing this, disconnect the brake assister vacuum pipes at the intake manifolds and the exhaust pipes at the exhaust manifolds. It is also advisable to remove the spark plug cover to prevent it from being damaged in case the engine is jacked up higher than necessary. To permit the engine to be jacked up, remove the through bolts in the supports at the rear on the transmission and take out the front engine support bolts, allowing the engine to pivot on the bolts at the flywheel housing.

To remove the harmonic balancer use special puller No. 109614, which has been designed for this purpose. (Use the long screws for the later type balancer and the short  $\frac{3}{8}$  U.S.S. screws for the earlier type.)

## Lubrication:

The supply of oil is carried in the oil pan, which is of cast-aluminum, ribbed to cool the oil. It contains ten quarts when filled to the proper level.

The same specifications for engine oil apply to the V-16 as to the Cadillac 353.

There are two oil filler holes, one in the center of each valve cover. The oil thus added flows down through the tubes around the valve push rods and into the crankcase.

The oil level indicator is on the crankcase at the rear end of the right-hand cylinder block.

The oil pump is mounted on the rear main bearing cap instead of on the front main cap as on the 353. It is driven by a spiral gear on the rear end of the camshaft. The oil is distributed from the pump to the main bearings through leads similar to those on the 353. The connecting rod bearings are supplied through passages drilled in the crankshaft, and the piston pins through passages drilled in the rods.

Camshaft bearing lubrication is provided by a tube in the crankcase carrying the oil from the rear main bearing to the rear camshaft bearing, and through the hollow camshaft to the other camshaft bearings. A tube from the front main bearing leads to the pressure regulator mounted on the front end of the crankcase. The pressure regulator spring is accessible without removing the front cover, as the plug holding the spring in place passes through the front cover. The regulator opens at 30 pounds pressure and discharges on the timing chain. A separate lead in the front of the crankcase carries oil to the automatic chain adjuster.

The oil from the rear camshaft bearing discharges into a compartment containing the oil pump driving gear, and from this compartment it is carried to a fitting on the rear end of the crankcase to which the pressure gauge and oil filter pipes are connected.

The return oil from the filter divides, one lead going to the rear of each cylinder block. The oil then passes through cored passages in the blocks to the cylinder heads, through the rear rocker shaft support brackets, and thence to the hollow rocker shafts, through which it is distributed to the rocker arms, valve stems and push rods. The discharge from the rocker arms keeps the dash pots of the automatic valve silencers full, and the overflow from the valve compartment flows down around the push rods and cam slides, thoroughly lubricating the cam slides and guides before finally returning to the crankcase.

## Exhaust System

Two entirely separate exhaust systems are used, one for each block of cylinders. Each system includes the exhaust manifold, an exhaust pipe, a muffler, an exhaust expansion chamber, and tail pipe.

Each exhaust manifold is in three sections to allow

for expansion, the sections being connected by tight fitting, leak-proof sleeves. The center section contains part of the heating chamber for heating the gasses passing from the carburetor to the intake manifold.



## Gasoline System

Except for the gasoline tank at the rear of the car, there are two separate gasoline systems. Each of these systems has its own feed line, vacuum tank, strainers and carburetor.

The feed lines pass down the two frame side bars to the dash on which are mounted the two vacuum tanks.

The vacuum tanks have chromium-plated jackets and top covers. These covers are held in place by a knurled nut on the hollow stud which, together with a hole in the side of the nut, provides a vent for the tank. This vent must always be kept open.

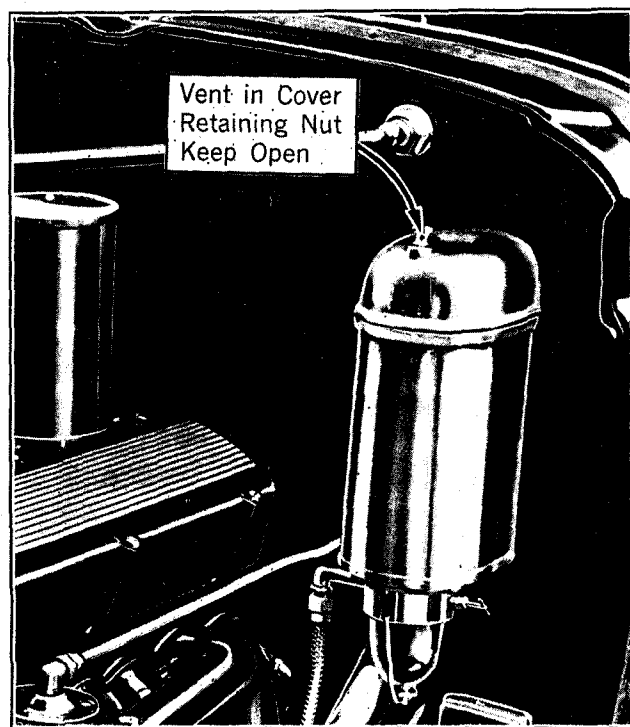


Fig. 37. The vacuum tank cover can be removed after taking off the retaining nut.

The vacuum fuel feed is taken care of by the vacuum pump only, while the intake suction operates the brake assister and the windshield wiper. The vacuum pump is located at the rear of the engine and is driven by an eccentric on the rear of the camshaft. The pump is not interchangeable with the 353 vacuum pump. There is no connection from the intake manifolds to the vacuum tanks.

### Carburetors:

The carburetors are essentially of the same type as the Cadillac 353 carburetor, but are smaller and are different in several important features. The throttle pump forms a separate casting fastened to the carburetor body. There are only two thermostats and no automatic throttle is used, the function of the automatic

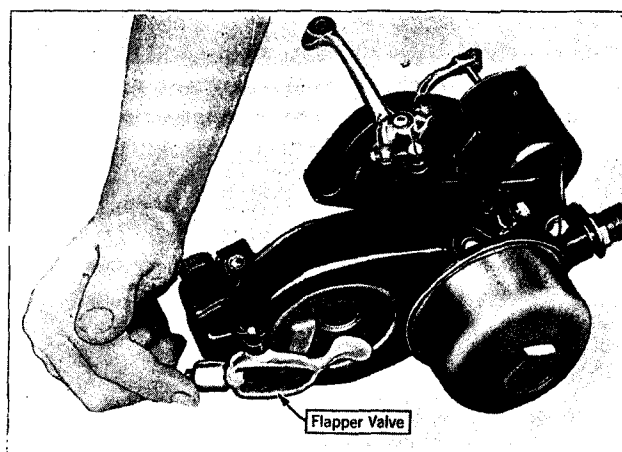


Fig. 38. The flapper valve is on the same shaft as the air valve.

throttle being performed by a flapper valve on the auxiliary air valve.

The auxiliary air valve and its thermostat are similar to those on the Cadillac 353 carburetor and the method of making these adjustments is the same.

The throttle pump thermostat is mounted under a flat cover on the side of the throttle pump body. The adjustment is accessible after removing the throttle pump from the carburetor and taking off the thermostat cover. When properly adjusted, the vent should close at approximately 75° and open at 80°.

**Carburetor Adjustments:** Both carburetors must not only be carefully adjusted, but must be equalized also. To make the complete adjustment proceed as follows:

Check the adjustment of the choke rods to make sure that when the choke button is pulled all the way out, the levers on both carburetors are against the stops.

Check the adjustment of the auxiliary air valve on each carburetor by noting the free opening of the valve to see that it is 1/16 in. to 3/32 in. when the choke is held all the way on. **This must be done at room temperature.**

Adjust the accelerator pedal stop screw so that when the throttle levers are in the wide open position, and against the stops on the carburetor, the accelerator pedal rests against the screw. (This stop screw was not provided on some of the first cars shipped and should be installed on all cars not already equipped with it.)

**Air Valves and Throttle Adjustment:** There are two methods of adjusting the throttle stop screws. The more satisfactory of these is with the use of the equalizing gauge, tool number 109626. The other method is by "killing" each block in turn, while the carburetor on the other block is being adjusted.



**Adjustment with Equalizing Gauge:** Run the engine until it is thoroughly warmed up and disconnect the throttle rod to the right-hand carburetor. Disconnect the brake assister vacuum lines from both manifolds. Hang the equalizing gauge on one of the radiator tie rods near the dash and connect the gauge to the vacuum fittings on the intake manifolds with the longer hose connected to the farther manifold. The gauge must hang straight so that the mercury columns are at the same level when the engine is not running.

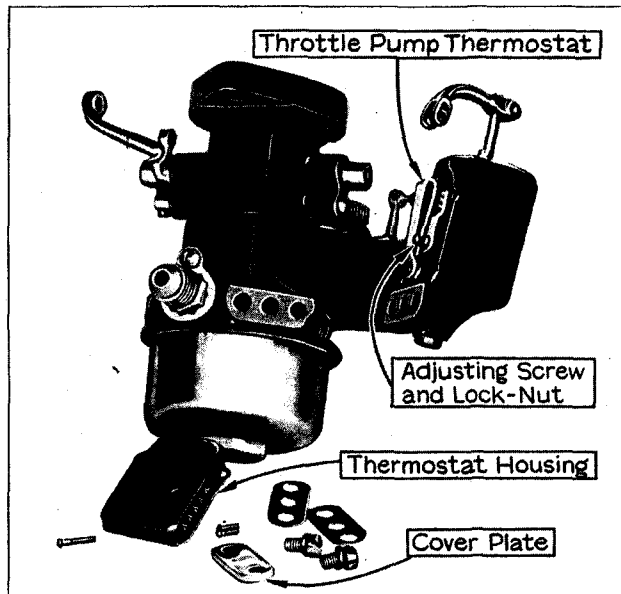


Fig. 39. The vents in the thermostat housing on the throttle pump should be kept open.

Make a preliminary adjustment of the air valves and throttles on both carburetors in the same manner as on the 353, 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 air valves 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, ad-

just both throttle stop screws, turning them exactly the same amount to secure the correct idling speed and at the same time keeping the mercury columns at the same level.

Re-check the air valve adjustment on each carburetor. (For accurate results be sure to use the following method: turn the adjusting screw clockwise, until the engine slows down from a rich mixture, then turn it counter-clockwise, counting the number of notches carefully until the engine slows down from a lean mixture, and finally turn the screw clockwise again just one-half the number of notches counted.)

After this adjustment has been made on both carburetors, recheck the idling speed, 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 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.

**Adjustment without Equalizing Gauge:** To adjust the carburetors by the second method where the equalizing gauge is not available, proceed as follows:

Disconnect the right-hand throttle control rod and block open the air valve of the right-hand carburetor with a small block of wood. Adjust the air valve of the left-hand carburetor in the same manner as on the Cadillac 353 and set the throttle stop screw so the engine will just turn over without stalling.

Then block open the air valve of the left-hand carburetor and adjust the air valve and the stop screw on the right-hand carburetor in a similar manner.

Remove the block from the left-hand carburetor. With the air valves and throttle stop screws on both carburetors properly adjusted, the engine should now 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 back off each air valve adjustment about three notches. It is important that both adjustments be backed off exactly the same number of notches.

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 just slip into place without affecting the throttle opening on either carburetor. This adjustment must be made very ac-

curately 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.

## Lighting System

The head lamps on the V-16 are Guide "Tilray" lamps and the focus adjustment is fixed. The only adjustment required is the aiming of the lamp, which is done in the same manner as on the Cadillac 353.

The bulbs used throughout the lighting system are the same as the corresponding bulbs on the Cadillac 353.

## Lubrication

The lubrication on the V-16 is similar to that on the 353, except for a few points. The fan is provided with a grease fitting and requires additional lubrication only once every 6,000 miles. Use G-11 chassis lubricant at this point.

There are three points of lubrication on the distributor instead of two. One of these is the oil hole in the timer distributor cam, which is the same as on the 353. The other points are external, one being a grease fitting on the distributor support, and the other an oiler on the breaker cup.

No lubrication is necessary at the front engine support, as the engine is mounted on rubber at both sides of the timing chain cover.

The throttle control rocker shaft is mounted on the top of the flywheel housing instead of on the dash, and the lubrication at this point is similar to that on the 353.

The V-16 has an additional point of lubrication on the torque tube. This is at the intermediate brake rocker shaft located about midway between the transmission and the rear axle.

The lubrication at all other points on the chassis is identical with the 353. The same material should be used and the same mileage intervals should be observed on the lubricating schedule.

## Springs

The springs are not interchangeable with the Cadillac 353 springs, as they are stiffer to take care of the greater weight of the car. The spring shackle bolts and bushings, however, are all interchangeable with the corresponding parts on the 353.

The springs are fitted with a new type of spring cover, consisting of metal sections which fit tightly over the spring leaves. No rebound clips are used.

These spring covers will retain the lubricant indefinitely, but if they need to be removed for any reason, this can be done with a pair of pliers. If care is taken, the covers will not be damaged and can be re-installed. When installing these spring covers, the spring must be under full lead.

## Shock Absorbers

The shock absorbers are the same type as on the Cadillac 353. Rear shock absorbers furnished by the Parts Division after February 20 are interchangeable, except as to metering pin and relief valve equipment.

The front shock absorbers however are not interchangeable with those on the 353.

The standard metering pins and relief valves are as follows:

V-16 Shock Absorbers				
	Metering Pins		Relief Valves	
	Bumper	Snubber	Bumper	Snubber
Front	29	31	P	P
Rear	14	30	P	J

## Steering Gear

The steering gear is of the worm and sector type, but differs from the Cadillac 353 steering gear in the use of tapered roller bearings above and below the worm, and a different type of adjustment for controlling the back-lash between the worm and sector. See Fig. 40. The ratio of the worm to the sector is also different, and is 17 to 1.

The steering gear housing is in two parts, one part carrying the worm and the other part providing the bearing for the sector shaft. The two parts of the housing are held together by three studs, a pivot bolt and an eccentric bolt. The holes for the three studs are oversize permitting the small amount of movement necessary to adjust the sector back-lash.

## Adjustments

The same three adjustments are provided as on the Cadillac 353 steering gear—sector shaft end-play, worm up-and-down play, and worm and sector back-lash. See Fig. 41.

The sector shaft end-play adjustment is the same as on the Cadillac 353. Make sure this adjustment is properly made before adjusting the worm up-and-down play and the back-lash.

Before adjusting the up-and-down play in the worm, disconnect the steering connecting rod from the steering gear arm.

Turn the steering wheel to the extreme right. Tighten the worm adjusting nut until a pull of two or three pounds is necessary to move the wheel toward the left. This pull should be measured with a spring scale attached to the rim of the steering wheel. In making this check hold the scale as close to the wheel as possible so that the line of pull will be practically tangent to the wheel. Check this adjustment also at the extreme left position of the wheel.

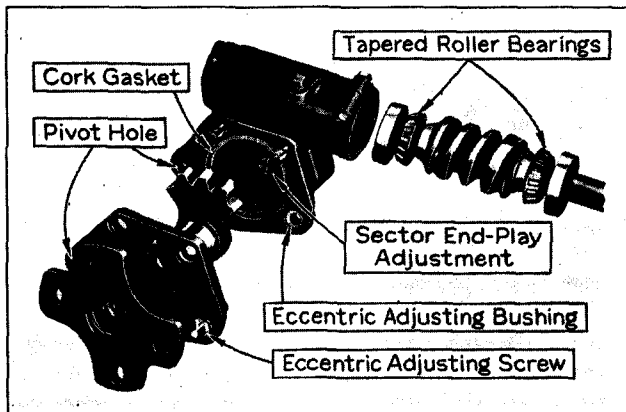


Fig. 40. Exploded view of the V-16 steering gear.

When the worm bearings have been properly adjusted check with the spring scale at the high point of the sector. The high point is exactly mid-way between the extreme right and left positions and corresponds to the straight ahead position of the wheels. If the drag at this point is between seven and eight pounds measured in the manner noted above, then no further adjustment of the gear is necessary.

If the drag at the high point is less than this the backlash between the worm and the sector should be adjusted. This adjustment is made by means of an eccentric bolt and an eccentric sleeve in the flanges of the two parts of the steering gear housing.

Loosen the nuts on all three studs and the pivot bolt a quarter turn and loosen the lock nut on the bolt one-half turn. The head of the eccentric bolt and the hexagonal part of the eccentric sleeve are each marked with a notch. As set up at the factory, the notch on the stud and the notch on the sleeve are not in line. Turning the bolt and the sleeve so as to bring the two notches toward each other moves the sector toward the worm. When the two notches are in line the limit of adjustment has been reached.

In making this adjustment use two wrenches, one on the bolt and one on the sleeve, turning both a very little and checking the drag with the spring scales. Repeat this operation only until the proper drag (5 lbs. to 6 lbs., at the high point) has been secured.

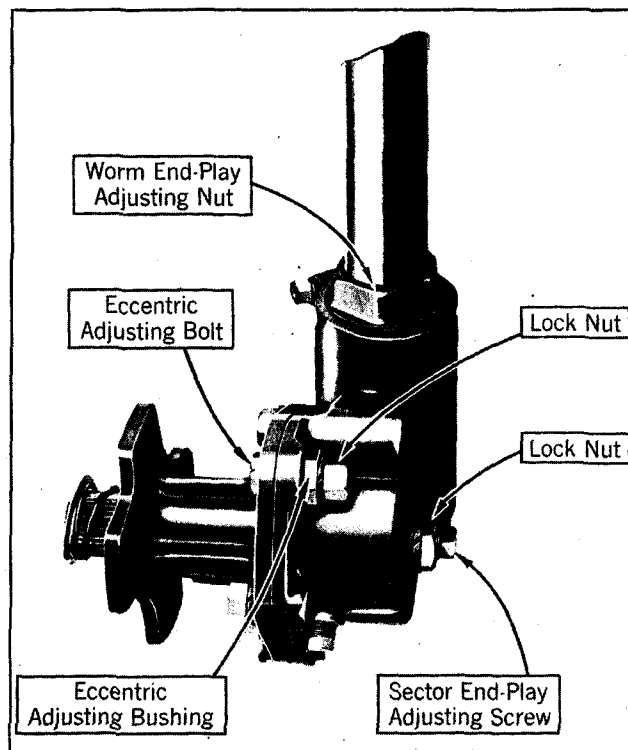


Fig. 41. Be sure all adjustments are made exactly as directed.

Tighten the stud nuts before tightening the adjustment lock nut. After tightening the adjustment lock nut, again check the adjustment with the spring scale to make sure the adjustments are correct. Connect the steering rod.

**Lubrication:** Use the same steering gear lubricant as specified for the Cadillac 353: A-200, with 5% (by volume) of graphite.

**Steering Modulator:** The steering modulator is the same as on the Cadillac 353 except that the springs have six coils instead of seven. The Part number of these springs is the same as the 353, and only six coil springs will be supplied by the Parts Division.

## Transmission

The transmission is similar to the Cadillac 353 transmission, but is not interchangeable, because the gear ratios are different. The following are the ratios of the V-16 transmission.

Intermediate — 1.5 to 1  
 Low — — — 2.5 to 1  
 Reverse — — — 3.0 to 1

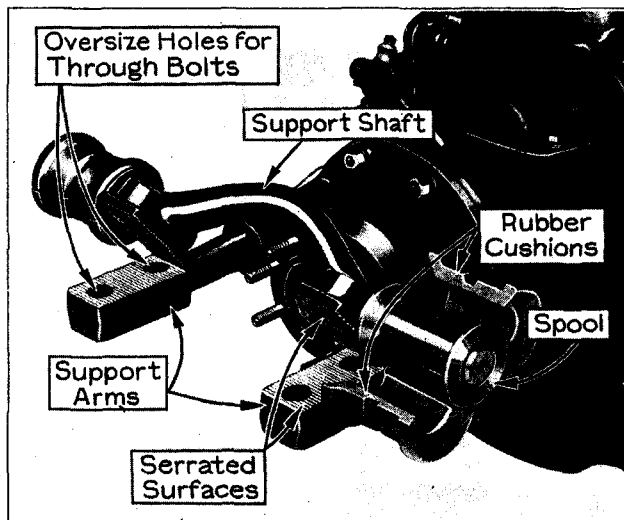


Fig. 42. Exploded view of support at the rear of the transmission.

The rear end of the transmission is used as a point of support for the engine, and when removing the transmission these supports must be disconnected. See Figs. 42 and 43.

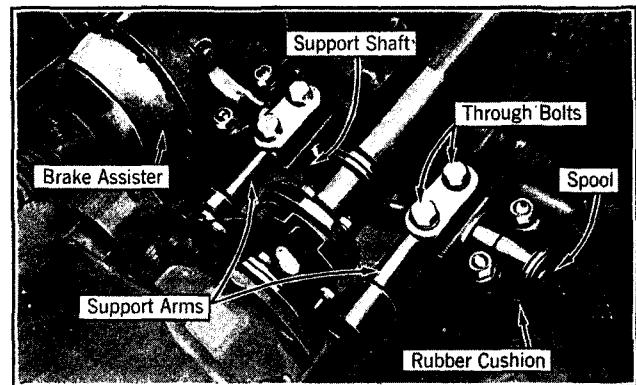


Fig. 43. The rear support is mounted in rubber on the center frame cross member.

The 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 a support shaft mounted in rubber on the frame. Each arm is attached to the support shaft by two through bolts. When removing the transmission it is merely necessary to remove the through bolts, after which the transmission can be removed as on the Cadillac 353.

Before reinstalling the transmission, loosen the engine support bolts on both sides of the flywheel housing as well as at both front supports. After installing the transmission, tighten the through bolts in the rear transmission support arms before tightening the other engine support bolts again. This permits the engine supports to properly align themselves.

## Wheels

The wheels and wheel bearings are the same as on the Cadillac 353. All adjustments, lubrication and service operations are the same.

The tires are the same size as on the 353. The

white walled tires furnished on the V-16 are especially balanced, however, and other tires should not be used, particularly on the front wheels, except temporarily in case of an emergency.

## Dash

There are two dash covers, one in front of the regular dash and the other behind it. The one behind the dash covers the various pipe lines as well as the mounting bolts for the vacuum tanks and the oil filter, and must be removed if it is ever necessary to take off these units or have access to the different pipe lines at this point. See Fig. 44.

All pipe line connections to the engine and to the tanks are accessible at the engine side of the dash, so it should never be necessary to remove the front false dash.

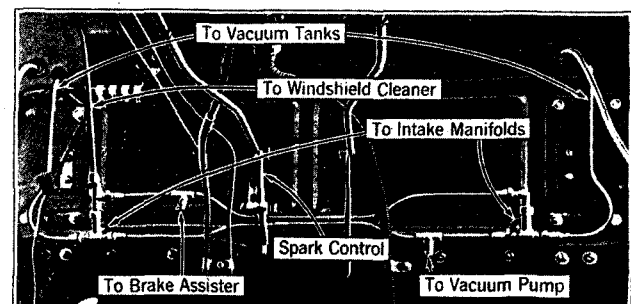


Fig. 44. The driver's side of the dash with the rear dash cover removed.

# THE BOOK OF FLEETWOOD



*A handbook of Fleetwood  
bodies for Cadillac and  
LaSalle retail salesmen.*



1929-1930  
CADILLAC MOTOR CAR COMPANY  
DETROIT, MICHIGAN

### *Regular finish, upholstery, and equipment*

**A**LL Fleetwood bodies are finished in Duco. Any color combination may be had at no extra charge. This is one of the strong sales appeals of Fleetwood.

In order that body styles may be kept in stock, certain color combinations have been selected as "stock" or regular. These are in the conservative shades which experience proves are most acceptable. These combinations will be used throughout the 1929-1930 season on the enclosed drive types and transformable types.

- 1—Duco Cromwell blue lower panels, hood, and window reveals.  
Black upper panels and moulding.  
Gold stripe.
- 2—Duco Mulberry maroon lower panels, hood, and window reveals.  
Black upper panels and moulding.  
Gold stripe.
- 3—Duco Alpinstock green lower panels, hood, and window reveals.  
Black upper panels and moulding.  
Cream stripe.
- 4—Duco Sable lower panels, hood, and window reveals.  
Black upper panels and moulding.  
Old ivory stripe.

All fenders and chassis black.

In addition, Fleetwood bodies in a variety of rich colors, lighter in shade, will be brought through periodically for stock. Bulletins will announce these.

Colors available on open types, All-Weather types, and Sedanette types will be announced periodically.

### UPHOLSTERY

**E**IGHT rich exclusive Fleetwood Doeskin Suede broadcloths by Wiese in subdued colorings harmonizing with any exterior color.

#### *Exclusive Fleetwood Wiese broadcloths:*

Weise 2969	- - - - -	- Green Gray
Weise 2970	- - - - -	- Maroon Taupe
Weise 2971	- - - - -	- Tan
Weise 2972	- - - - -	- Silver Gray
Weise 2973	- - - - -	- Blue Gray
Weise 2994	- - - - -	- Tan Taupe
Wiese 3288	- - - - -	- Dark Gray
Wiese 3363	- - - - -	- Dark Taupe

Optional in all enclosed drive and transformable types.

Three special Venetian mohairs of short nap.

#### *Exclusive Fleetwood Venetian mohairs:*

108-T	- - - - -	- Green
109-T	- - - - -	- Gray
110-T	- - - - -	- Taupe

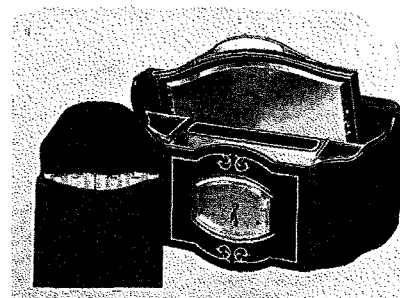
Optional in all enclosed drive and transformable types.

The first two blend well with complementary body colors, Taupe, because of its neutral shade, going well with any color.

Fifteen special exclusive Fleetwood Aero leathers by Radel. These are lightweight, soft, pliable, and luxurious, four being specified for stock with the balance optional without extra charge, with a reasonable added time allowance.

#### *Special Radel Aero leathers:*

5885	- - - - -	- Silver Gray
451	- - - - -	- Pearl Gray
2646	- - - - -	- Blue Gray
5897	- - - - -	- Green Blue
68	- - - - -	- Blue (Standard)
6016	- - - - -	- Dark Blue
9205	- - - - -	- Deep Maroon
5875	- - - - -	- Rich Maroon
4339	- - - - -	- Green (Standard)

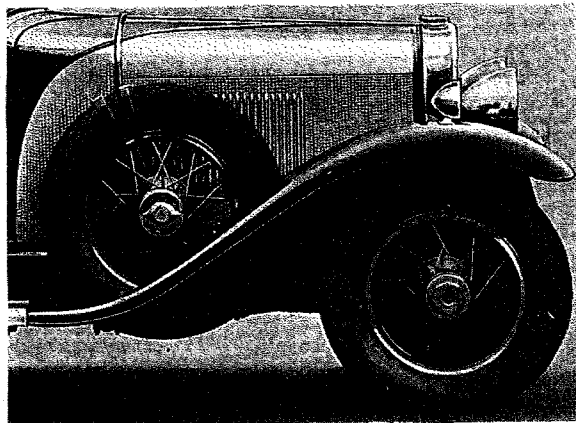


Vanity cases are designed exclusively for Fleetwood bodies and contain 8-day clock, mirror, leather cigarette case, and two ash receivers



6019	- - - - -	Soft Green
6012	- - - - -	Dark Green
9128	- - - - -	Light Brown
9131	- - - - -	Dark Brown
743	- - - - -	Tan (Standard)
2645	- - - - -	Black (Standard)

Optional in All-Weather Phaeton, Sedanette, and open types.



This picture shows a hood with damaskeen finish, a unique and attractive treatment

Six weatherproof Bedford cords by Wiese. The corded fabrics are used for seats with plain material to match for head linings. The waterproof feature of these materials makes them especially desirable for All-Weather types.

*Special waterproof Wiese Bedford cords:*

Wiese 2659-F, 2759-F	- - - - -	Green Gray
Wiese 2661-F, 2761-F	- - - - -	Brown Gray

Wiese 2662-F, 2762-F	- - - - -	Gray
Wiese 2663-F, 2763-F	- - - - -	Blue Gray
Wiese 2665-F, 2765-F	- - - - -	Maroon Taupe
Wiese 2666-F, 2766-F	- - - - -	Tan Taupe

Optional in All-Weather Phaeton and Sedanette types.

With the wide variety offered in the regular exclusive Fleetwood upholstery materials, we recommend that cloths be selected from Wiese collection No. 61 *only when absolutely necessary*, as there will be delays involved in securing curtains and other trimming materials to match. These delays are avoided in the case of the regular Fleetwood materials.

*Enclosed drive types and transformable types.*

Eight exclusive Fleetwood Wiese broadcloths—optional.

Three exclusive Venetian mohairs—optional.

Any material in current Wiese Collection No. 61—optional.

*All-Weather and Sedanette types:*

Fifteen Fleetwood Radel Aero leathers—optional.

Six weatherproof Fleetwood Wiese Bedford cords—optional.

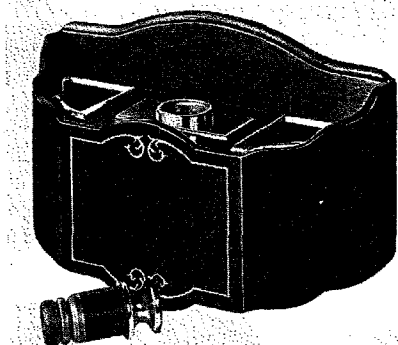
*Open types:*

Fifteen Fleetwood Radel Aero leathers—optional.

(In the case of All-Weather Phaetons, Sedanettes, and open types, four of the exclusive Fleetwood Radel Aero leathers in the sample book will be specified for stock. The balance are optional with reasonable added time allowance.)



The distributing organization has already been furnished with samples of the three exclusive Fleetwood Venetian mohairs available. The distributing organization will be furnished with sample books of the eight exclusive Fleetwood Wiese doeskins, the six special weatherproof Wiese Bedford cords and the fifteen exclusive Fleetwood Radel Aero leathers as soon as such books are available.



Smoker's set has inlaid case, with removable cordless lighter, and two ash receivers

### EQUIPMENT

Equipment common to all body styles of each type (Sedans, Town Cabriolets, etc.) is found on pages 18 to 24. Equipment exclusive to each individual body style is listed on the page facing the illustration of that body style.

Wiring for radio installation is included in all body styles except 3902, 4002, 4060, 4057.

### BODY STYLE OPTIONS

The four Town Car models—Fleetwick, Fleetmont, Fleetcrest, and Fleetbourne—can be had with collapsible rear quarters. Fleetwick, Fleetmont and Fleetcrest in stock, Fleetbourne to order.

Extra charges are:

Style 3912-C	- - - - -	\$750
Style 3920-C	- - - - -	800
Style 3925-C	- - - - -	750
Style 3991-C	- - - - -	800

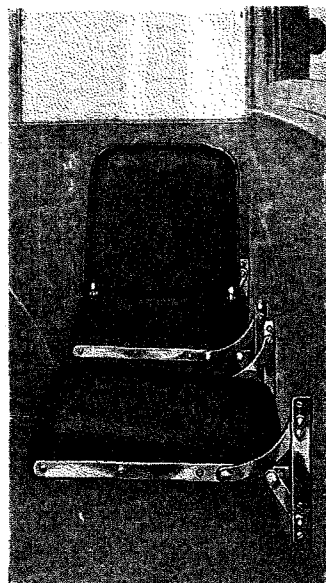
The same feature can be had on all Sedans and Imperials for the following extra charges:

Style 3975-C	- - - - -	\$800
Style 3975-SC	- - - - -	800
Style 3930-SC	- - - - -	800
Style 3930-C	- - - - -	800
Style 3955-SC	- - - - -	750
Style 3955-C	- - - - -	750

*Note:* Prices apply *only before* metal has been built on wood frame. If collapsible rear quarter is wanted on body already "in metal," individual price quotation is necessary. Delivery time—4 weeks additional.

Back windows—Special size or shape	- - -	\$125
Quarter windows—Special size or shape	- - -	250
Leather quarters—Sedans and Imperials—Non-collapsible leather quarters with landau bows, quarter windows retained. Three weeks additional time	- - - - -	250

Without quarter window (3975 or 3975-S only) three weeks' additional time	- - \$300
Plain motor hood without raised panel (See page 86)	- 250
Sedanettes and Sedanette Cabriolet in special leather top material—Tan, grained to look like Burbank cloth	- - - - 175
Opera seats—Instead of forward facing, in 3975, 3975-S, 3920, 3925, 3991	- - - - 125
Concealed in 3912—lazyback omitted on left seat	- - - - 200
In Five-Passenger Sedans	- - - - 128



The Fleetwood "opera" seats, although designed for occasional use only, are remarkably comfortable. They are attached to the interior partition and fold up out of the way when not in use. As is shown, one seat faces the rear, the other with back, faces sideways. Seats are adjustable as to height

Sliding glass division—In Imperials and Town Cars with standard auxiliary seats	- - - \$150
With concealed auxiliary seats	- - - 250
More head room—Providing 52 1/2 inches	- - - 650
Roof baggage rail—(Roof strengthening; painted or chromium rail)	- - - 425
Omitting glass division with stationary Sedan front seat—All-Weather Phaetons	- - - 200
Glass division, Sedanettes and Sedanette Cabriolets—between front and rear compartments	- - 200
Transformable driver's roof solid—Permanent	- - 275
Detachable—with flexible extra roof curtain	350
Full flush glass division for 3975 (Same as standard in five-Passenger Imperials Styles 3930, 3955)	150
Wheels—Wood is standard. Regular extra charges on Fisher Body cars apply on Fleetwoods for any special wheel equipment.	

*Note:* Prices apply only on cars not yet built up at Fleetwood factories.

No credit or allowance on regular equipment omitted.

### COLOR OPTIONS

*Color book*—The Fleetwood Company has issued a color book containing samples of suggested colors which can be specified for cars in addition to the four colors shown on page 101.

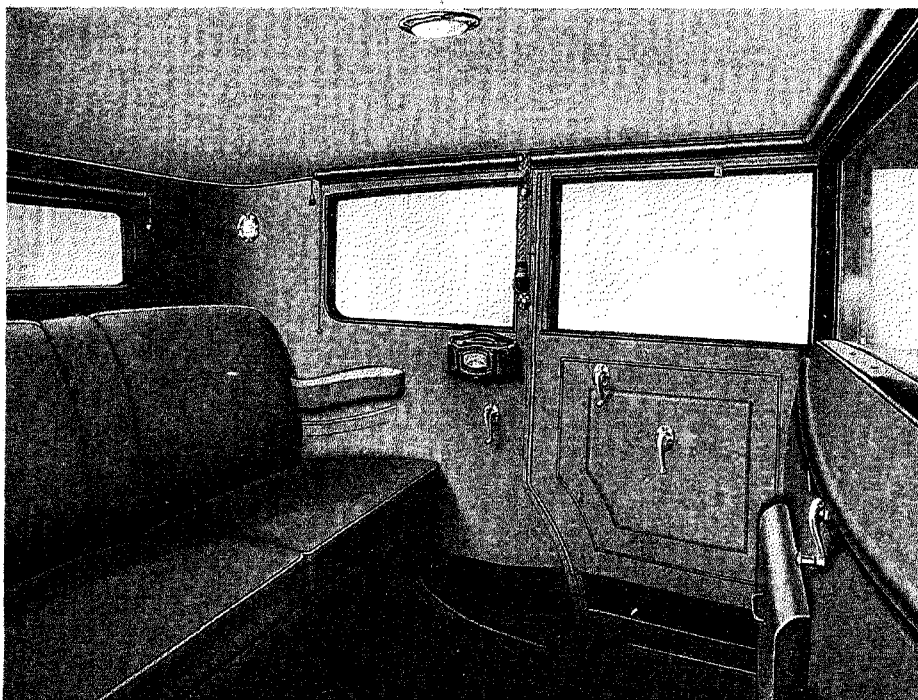
*Upper and lower panels*—Any color. (Includes striping.) No charge.

*Fenders*—Special colors at regular extra charges.

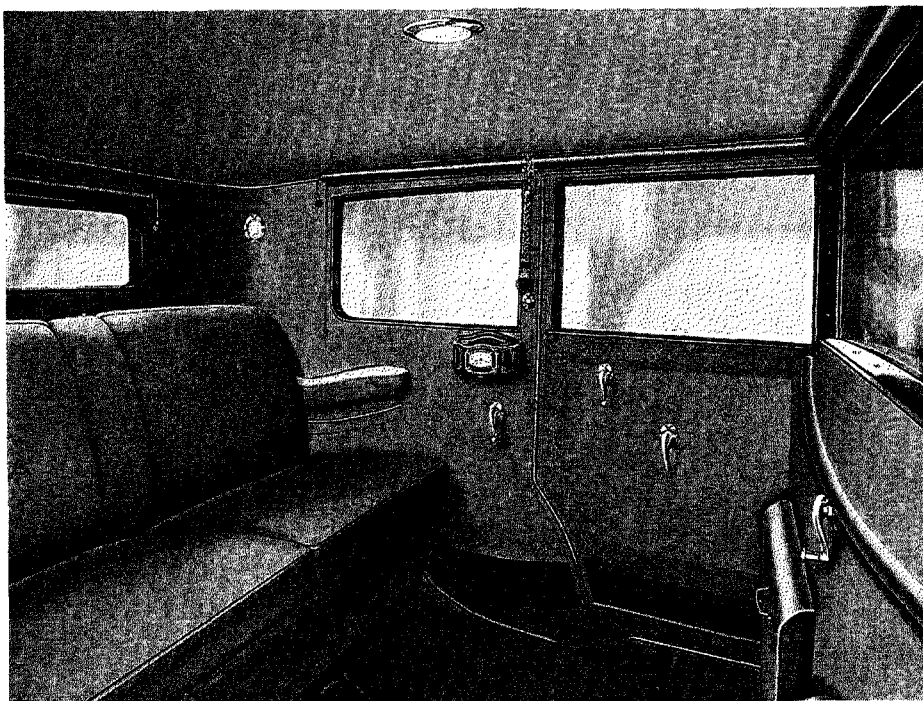
*Colored leather quarters*—For Cabriolets or Town Cars, Sedan and Imperial Cabriolet types; to match upper panels - - - - - No Charge

*Damaskeen woods*—Engine turned finish - - - \$265

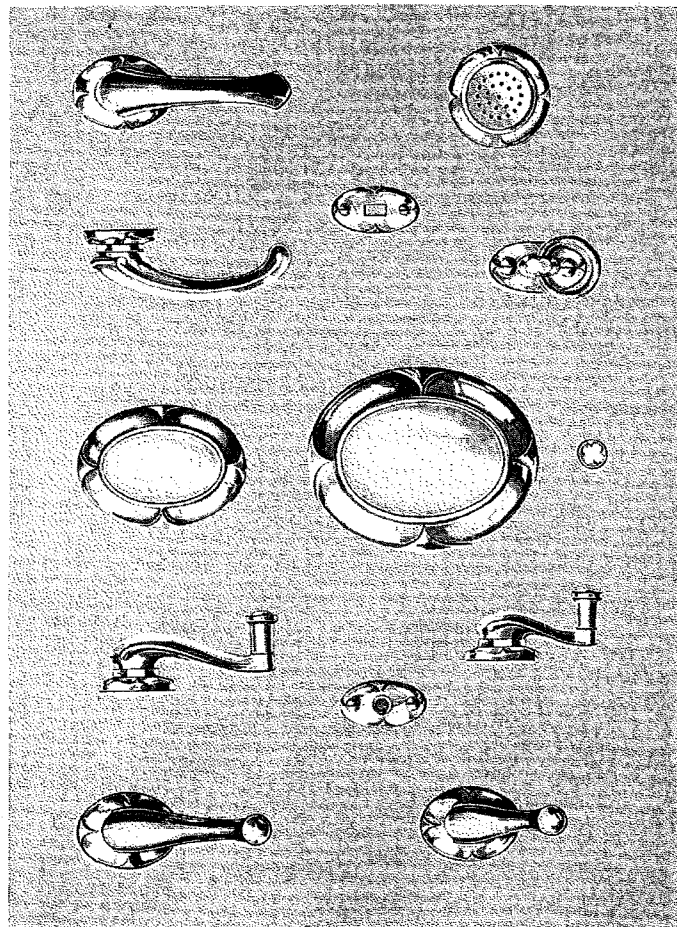
*Varnish*—Seven weeks additional for varnish finish, all body styles. No guarantee - - - 250



An interior view of one of the bodies. Note the general air of distinction, luxury, and roominess, the deep sprung seats with center and side arm rests upholstered in unobtrusive shades of broadcloth; also the side pockets and exclusive Fleetwood design of hardware



This picture shows one of the distinctive effects which may be achieved when a body is finished to individual requirements. In this case, the purchaser desired an outstanding and individual interior and specified Wiese broadcloth upholstery, embroidered in medallion effect with needlepoint work—the result being one of rare beauty



Hardware is created specially for the Fleetwood line, of beautiful design with chromium plated finish

## UPHOLSTERY OPTIONS

See upholstery section, page 102.

*Style*—Tufted, pleated, etc., if ordered before body goes to Trim Department - - - - - No Charge

*Special materials*—Not included in Fleetwood broadcloths, mohairs, Bedford cords, Aero leathers or Wiese book, No. 61 - - - - - \$100

Needlepoint medallions, with broadlace on doors and divisions - - - - - 300

*Leather*—Transformables, Sedanettes, and enclosed drive types, front and rear cushions, balance broadcloth - - - - - No Charge

Seat cushions and up to belt - - - - - \$ 50

Entire interior, front and rear - - - - - 150

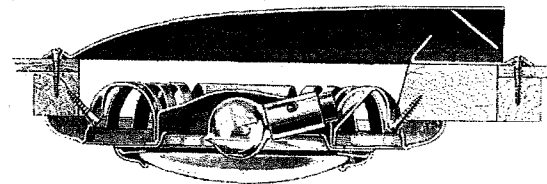
Colored, for All-Weather Phaetons, Sedanettes and open types (other than four standard colors) in Aero leather book, four weeks' additional time) - - - No Charge

*Cushions*—Any height, slope, or depth; provided orders are received before body goes into trim and standard seat box can be used - - No Charge

*Lap robes*—Monogrammed, crushed plush backing - - - - - \$ 80 (Up)

*Pockets*—Flush type not possible. Envelope type attached on all doors - - - - - \$ 75

*Down pillow*—Not standard, if desired - - - 18



The handsome Fleetwood ventilating dome light not only illuminates the interior at night but ventilates the ceiling whenever the car is in motion

## EQUIPMENT OPTIONS

<i>Foot rail</i> —Carpet-covered, to replace hassocks. (Must be ordered before body leaves factory) No charge	
<i>Mats</i> —Rubber for front compartment all types	\$ 18
<i>Linoleum</i> —Metal bound, front floor boards, all types	32
<i>Extra carpet</i> —For rear or front compartment	25
<i>Hardware</i> —Colored to match upholstery	25
Other finishes	\$ 25 (Up)
Special design	On Quotation
<i>Vanity and smoking sets</i> —For All-Weather and Sedanette types, attached to division	
Vanity	\$ 55
Smoking	26
Special finish	On Quotation
<i>Inside moldings</i> —To match vanity cases in special finish	
	\$ 35 (Up)
<i>Robe rails</i> —Bar and cord type can be interchanged after delivery without damage to upholstery. (Bar type cannot be used with opera seats.)	
Bar type Ducoed to match upholstery. (Must be ordered before body leaves factory. No charge	
Cord type to match upholstery. (Must be ordered before body leaves factory. No charge	
<i>Ash receivers</i> —Flush type for front doors where not standard	\$ 15
<i>Division clock</i> —French walnut case	40

NOTE: All of the above extra charges are *list*, subject to special discount applying on extra charges covering special features on Fleetwood line.

## Service

FLEETWOOD bodies are built with maximum care and close inspection in every detail of their construction to the end that the maximum of service and comfort will be rendered to every owner.

In addition to this careful manufacturing policy, service facilities have been arranged with the Fisher Body Corporation in order that all Fleetwood owners may have Fleetwood body service available in their respective communities. In addition to the parts depots in the factories at Detroit and Fleetwood, which service the East, Central West, and South, Fisher Body Corporation has a parts depot at Oakland, California, to service the Pacific coast country.

These facilities reduce the time element in correspondence and transportation to secure equipment necessary to restore the body to use.

There are also seven Service Headquarters located in New York, Detroit, Atlanta, Kansas City, Dallas, Minneapolis, and Oakland, from which points Fisher men operate, these men being thoroughly familiar with Fleetwood bodies and competent to properly make any repairs or adjustments.



U3-4

File Reference JAN. 1930

**General Motors Corporation**

**Research Laboratories**

**Detroit, Mich.**

**DATA BOOK**

### INTRODUCTION

These specifications of General Motors cars were originally compiled to furnish a convenient manual of useful information to the personnel of the Research Laboratories. To insure the accuracy of the data each Division was asked to supply the information on its products. In return for this the chief engineer or whoever he might designate has been furnished with a copy of the complete data.

The books have a limited distribution and the names of all persons holding copies are given on page 25.

While every precaution is taken that errors do not occur, it sometimes happens that they do creep in. New sheets are checked against the original data from the Divisions and the sheets are looked over for any apparent errors in the originals. Except for these checks, the book contains the original values given by the Divisions.

It is hoped that curves run under conditions set up in the General Motors Engine Test Code can hereafter be included and that data from the different engineering departments will then be directly comparable.

A good supply of current sheets is always kept on hand and a limited supply of old ones. Consequently, any reasonable request for sheets whether old or new can be supplied.

If any errors or changes in the specifications are found, communicate with the Technical Data Section of the Research Laboratories, Detroit.

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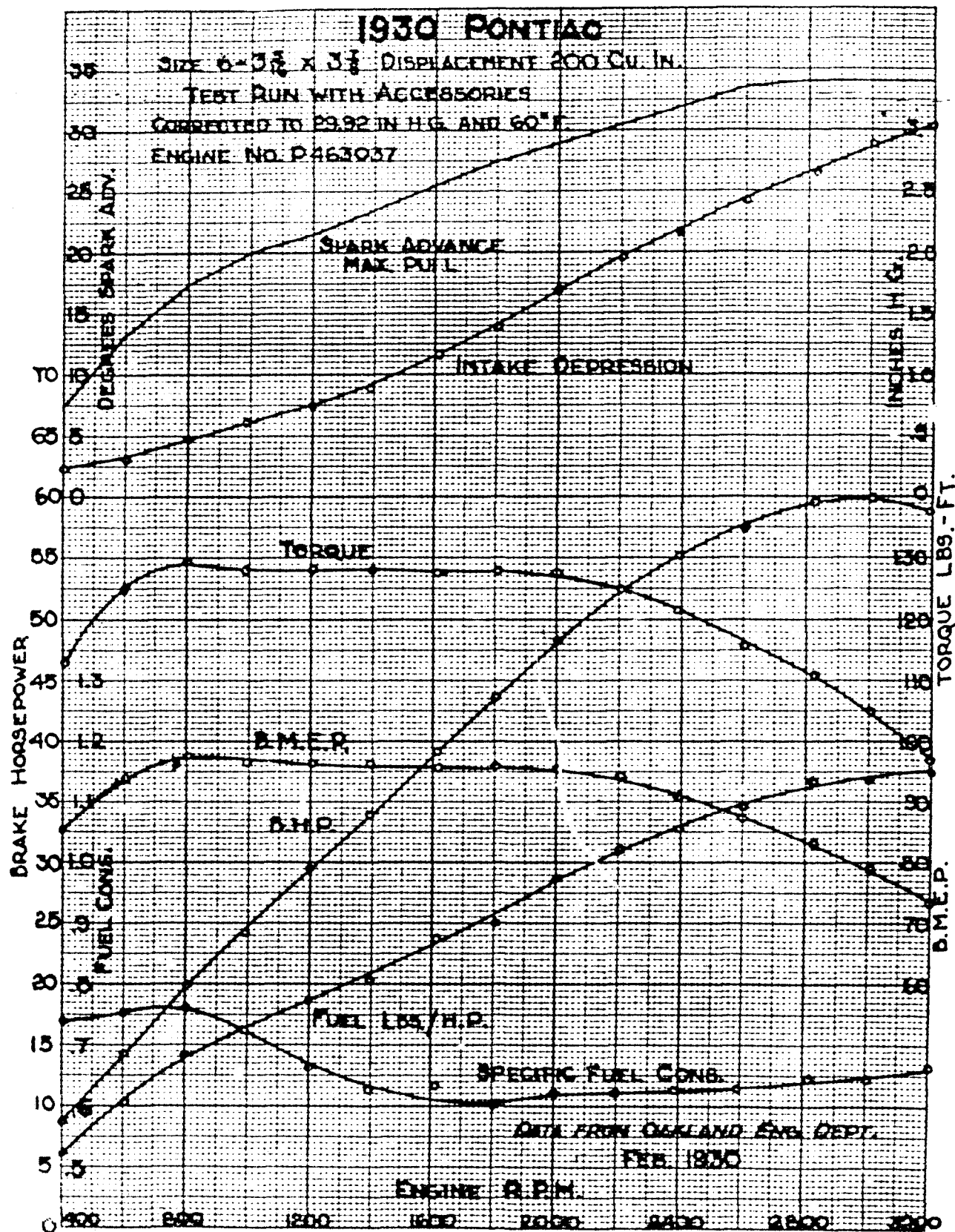
CAR	1930 CHEVROLET
WHEELBASE	107
TIRES Size	4.75-19
Rolling Cir.	7.38
Make & Pressure	Goodyear & Goodrich at 35 lbs.
ROAD CLEARANCE	8-3/8
TURNING RADIUS, R. & L.	19-3/4
WEIGHTS Front	1241
Rear	1431
Total Road	2672
SPRINGS Front	Semi-Ell. 36 x 1-3/4
Rear	Semi-Ell. 54 x 1-3/4
ENGINE Size	6 3-5/16 x 3-3/4
Displacement	194
Weight	479
Compression Ratio	5.017
Cylinder Offset	None
Balancer	Yes
Counterbalanced	No
Main Bearings Length	1-3/4, 2, 2-3/16
Main Bearing Dia.	1-15/16, 2, 2-1/16
Conn. Bearings L. & Dia.	1-3/8 x 2
Conn. Rod Length	7
Piston Material	Cast Iron
Valves: Head Diam.	In. 1-29/64 Ex. 1-11/32
Port Diam.	In. 1-5/16 Ex. 1-13/64
Seat Angle	45°
Lift	.277
Lash	In. .058 Ex. .008
Valve Timing: IO	4° ATC
IC	42° ABC
EO	47° BBC
EC	4° ATC
Initial Spark Setting	12° BTC
Firing Order	1-5-3-6-2-4
Carburetor Make & Size	Carter 1"
Oil Capacity	5-1/2 qts. - 5 qts. refill
Water Capacity	10 qts.
GEAR RATIOS: Low	*18-27 *3.32:1
Second	25-20 1.77:1
Reverse	14-18, 15-31, 19-27 4.2:1
Rear Axle	10-41 4.1

NOTES: Engine weight includes everything attached to engine less transmission and clutch. Car weights of two door five passenger sedan including gas, oil and water with spare tire but no passengers from Chevrolet \*Gear Ratios: First figures are number of teeth in driver to number of teeth in driven gears, second figures are gear ratios B.H.P., B.M.E.P. and torque values are not yet available. DATA from Chevrolet Engineering Department, March 1930.

CAR	1930 PONTIAC	
WHEELBASE	110	
TIRES Size	29 x 5.00	
Polling Cir.	7.46	
Make & Pressure	32 lbs. minimum F & R	
ROAD CLEARANCE	8-1/2	
TURNING RADIUS	19'-11"R, 19'-7"L	
WEIGHTS Front	1292	
Rear	1503	
Total Road	2800	
SPRINGS Front	Semi-Ell. 36 x 2	
Rear	Semi-Ell. 54 x 2	
ENGINE Size	6 3-5/16 x 3-7/8	
Displacement	200	
Weight		
Max. B.H.P.	60 at 3000	
Max. B.M.E.P.	97 at 1000	
Max. Torque	129 at 1000	
Compression Ratio	4.9	
Cylinder Offset	No	
Balancer	Yes	
Counterbalanced	Yes	
Main Bearings Length	1-5/8, 2, 2	
Main Bearing Dia.	1-15/16, 2, 2-1/16	
Conn. Rod Bearings L. & Dia	1-5/16 x 2 1-7/16 x 2-1/16	
Connecting Rod Length	7-5/16	
Piston Material	Cast Iron	
Valves: Head Diam.	In. 1-13/32 Ex. 1-11/32	
Port Diam.	In. 1-1/4 Ex. 1-3/16	
Seat Angle	45°	
Lift	5/16	
Lash	In. .007 Ex. .009	
Valve Timing: IO	7° ATC	
IC	39° ABC	
EO	42° BBC	
EC	7° ATC	
Initial Spark Setting	4° BTC	
Firing Order	1-5-3-6-2-4	
Carburetor Size and Make	Marvel 1-1/4	
Oil Capacity	6 qts.	
Water Capacity	14 qts.	
GEAR RATIOS: Low	*18-27	*3.32:1
Second	25-20	1.77:1
Reverse	18-27	4.21:1
Rear Axle	12-53	4.41:1

NOTES: Car weights for 2 door sedan including water, oil, gasoline, spare tire, bumpers, spring covers and spare tire cover, B.M.E.P. and torque values from curves in this book. \*Gear Ratios: First figures are number of teeth in driver to number of teeth in driven gear. Second figures are gear ratios.

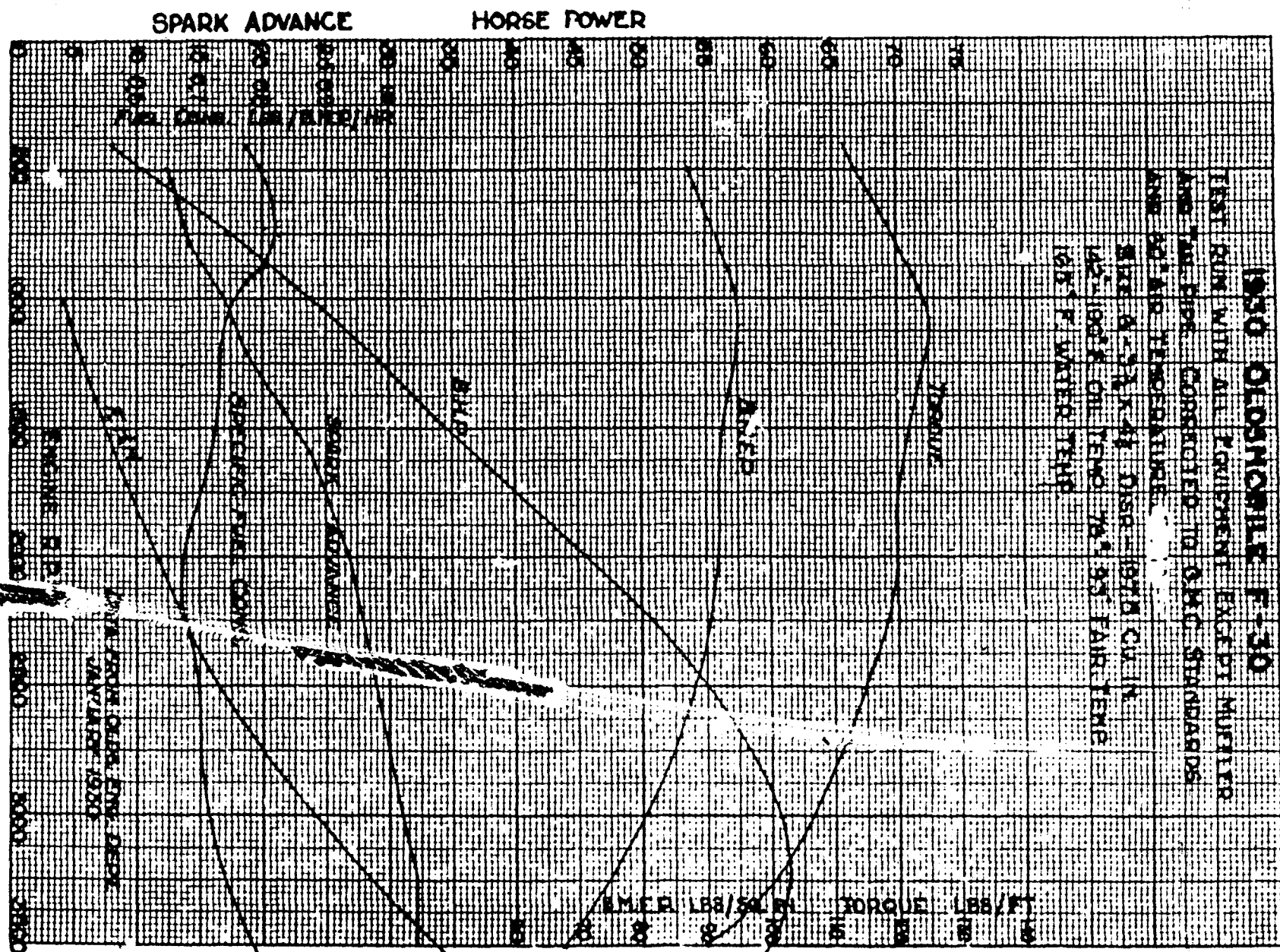
DATA from Oakland Engineering Department, February 1930.



CAR	1930 OLDSMOBILE	
WHEELBASE	113-1/2	
TIRES Size	28 x 5.25	
Rolling Cir.	7.225	
Make	U. S. at 357	
ROAD CLEARANCE	8	
TURNING RADIUS, R. & L.	19-1/2	
WEIGHTS Front	1436	
Rear	1532	
Total Road	2968	
SPRINGS Front	Semi-Ell. 35" x 2"	
Rear	Semi-Ell. 54-1/2 x 2	
ENGINE Size	6 3-3/16 x 4-1/8	
Displacement	197.5	
Weight	533	
Max. B.M.P.	61.5 at 3200	
Max. B.M.E.P.	95 at 1100	
Max. Torque	125 at 1100	
Compression Ratio	5.2	
Cylinder Offset	None	
Balancer	No	
Counterbalanced	Yes 40%	
Main Bearings Length	1-3/4, 1-3/4, 1-3/4, 2-5/16	
Main Bearing Dia.	2-1/4, 2-5/16, 2-7/16, 2-1/2	
Conn. Rod Bearings L. & Dia.	1-3/8 x 1-7/8	
Connecting Rod Length	9	
Piston Material	Cast Iron	
Valve: Head Diam.	In. 1-17/32	Ex. 1-13/32
Port Diam.	In. 1-5/16	Ex. 1-1/4
Seat Angle	In. 30°	Ex. 30°
Lift	In. .320	Ex. .320
Lash	In. .008	Ex. .010
Valve Timing: IO	TDC	
IC	50°	ABC
EO	40°	BBC
EC	10°	ATC
Initial Spark Setting	8°	BTC
Firing Order	1-5-3-6-2-4	
Carburetor Make & Size	Johnson 1-1/4	
Oil Capacity	6 qts.	
Water Capacity	13 qts.	
GEAR RATIOS: Low	3	
Second	1.75	
Reverse	3.857	
Rear Axle	4.54 (50-11)	

NOTES: Engine weight complete except transmission, clutch and housing. Car weight from Oldsmobile for 2-door 5-passenger sedan including gas, oil and water, spare tire, bumpers and tools but no passengers. Torque, B.H.P. and B.M.E.P. values from performance curves in this book.

DATA from Oldsmobile Engineering Department, January 1930.



## CAR

## 1930 MARQUETTE

WHEELBASE	114
TIRES Size	28 x 5.25
Rolling Cir.	7.27
Make	
ROAD CLEARANCE	8
TURNING RADIUS, R. & L.	19.3
CURB WEIGHTS Front	1482.25
Rear	1649.75
Total Road	3132
SPRINGS Front	Semi-Ell. 35 x 2
Rear	Semi-Ell. 54-1/2 x 2
ENGINE Size	6 3-1/8 x 4-5/8
Displacement	212.8 Cu. in.
Weight	603
Max. B.H.P.	67.5 at 3000
Max. B.M.E.P.	102 at 1000
Max. Torque	144.5 at 1000
Compression Ratio	5.2
Cylinder or piston offset	Piston Pin 3/32
Balancer	No.
Counterbalanced	Yes
Main Bearings Length	1-15/32, 1-1/2, 1-1/2, 1-29/32
Main Bearing Dia.	2-5/16, 2-3/8, 2-1/2, 2-9/16
Conn. Rod Bearings L. & Dia.	1-3/8, 2-1/8
Connecting Rod Length	9-3/4
Piston Material	Cast Iron
Valves: Head Diam.	1-5/8 In. Ex. 1-1/2
Port Diam.	1-1/2 In. Ex. 1-3/8
Seat Angle	45°
Lift	.324
Lash (Hot)	.006
Valve Timing: IO	5° BTC
IC	45° ABC
EO	45° BBC
EC	18° ATC
Initial Spark Setting	7° Advance
Firing Order	1-5-3-6-2-4
Carburetor Make & Size	Harvel V. M.
Oil Capacity	7 qts.
Water Capacity	3 gallons
GEAR RATIO: Low	3.60 to 1
Second	1.75 to 1
Reverse	3.857 to 1
Rear Axle	50-11 or 4.545 to 1

NOTES: Car weight from Buick for five passenger 2-door sedan with gas, oil and water, spare tire, bumpers, tools, but no passengers. Engine weight includes everything attached to engine as used in the car less transmission and clutch. B.M.E.P., B.H.P. and torque from curves in this book.

DATA from Buick Engineering Department, July 1929.

# 1930 MARQUETTE

SIZE 6-3/4 x 4-1/2

DEEP - 2128 CLIN.

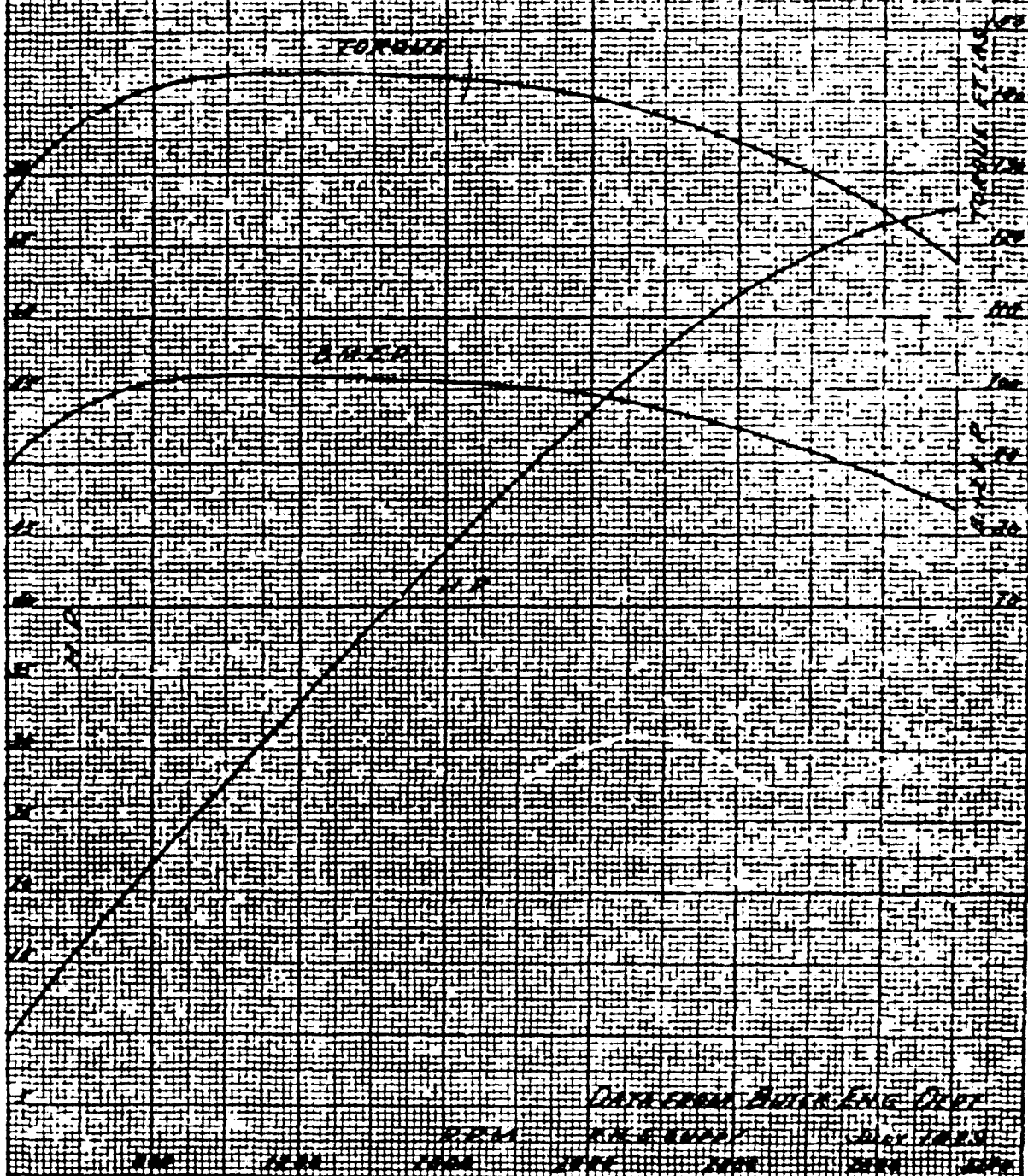
COMP. RATIO 1.2

COND. 35 LBS/150 IN.

DRY PWT. WITH ALL REGULAR EQUIPMENT EXCEPT RADIATOR AND FAN.

TEMP. TO 19.02 BAROMETER AND 60° TEMP.

FORMULA



ANAL.

DATA FROM AUTO. ENG. DEPT.

1930

1931

1932

1933

1934

1935

1936

1937

1938

1939



CAR		1930 OAKLAND	
WHEELBASE		117	
TIRES Size		28 x 5.50	
Rolling Cir.		7.3	
Pressure		34 lbs.	
ROAD CLEARANCE		8-1/8	
TURNING RADIUS		20'-2" R, 20'-5" L.	
WEIGHTS Front		1608	
Rear		1645	
Total Road		3253	
SPRINGS Front		Semi-El1. 36 x 2	
Rear		Semi-El1. 54-1/2 x 2	
ENGINE Size		V-8 3-7/16 x 3-3/8	
Displacement		251	
Weight		789	
Max. B.H.P.		79 at 3200	
Max. B.M.E.P.		94 at 1200	
Max. Torque		156 at 1200	
Compression Ratio		5.0	
Cylinder Offset		None	
Balancer		No	
Counterbalanced		Yes - Correct	
Main Bearings Length		2-1/4, 2-3/8, 2-5/8	
Main Bearing Diam.		2-1/4, 2-5/16, 2-3/8	
Conn. Rod Bearings L. & Dia.		1-1/4 x 2-1/4	
Connecting Rod Length		6-5/8	
Piston Material		Cast Iron	
Valves: Head Diam.		In. 1-1/2 Ex. 1-3/8	
Port Diam.		In. 1-3/8 Ex. 1-1/4	
Seat Angle		45°	
Lift		.33	
Lash		In. .011 Ex. 013	
Valve Timing: IO		TC	
IC		40° ABC	
EO		45° EBC	
EC		15° ATC	
Initial Spark Setting		7° BTC	
Firing Order		1-4-5-2-7-6-3-8	
Carburetor Make & Size		Marvol 1-3/4	
Oil Capacity		7 qts.	
Water Capacity		25 qts.	
GEAR RATIOS: Low		*18-27	*3:1
Second		24-21	1.75:1
Reverse		14-27	3.85:1
Rear Axle		53-12	4.42:1

NOTES: Car weight for five passengers, 2-door sedan including water, oil, gasoline, spare tire, bumpers, spring covers and spare tire cover. Curves from dynamometer engine. B.M.E.P and torque from curves in this book. \*Gear Ratios: First figures are number of teeth in driver to number of teeth in driven gear. Second figures are gear ratios.



# 1930 OAKLAND V-8

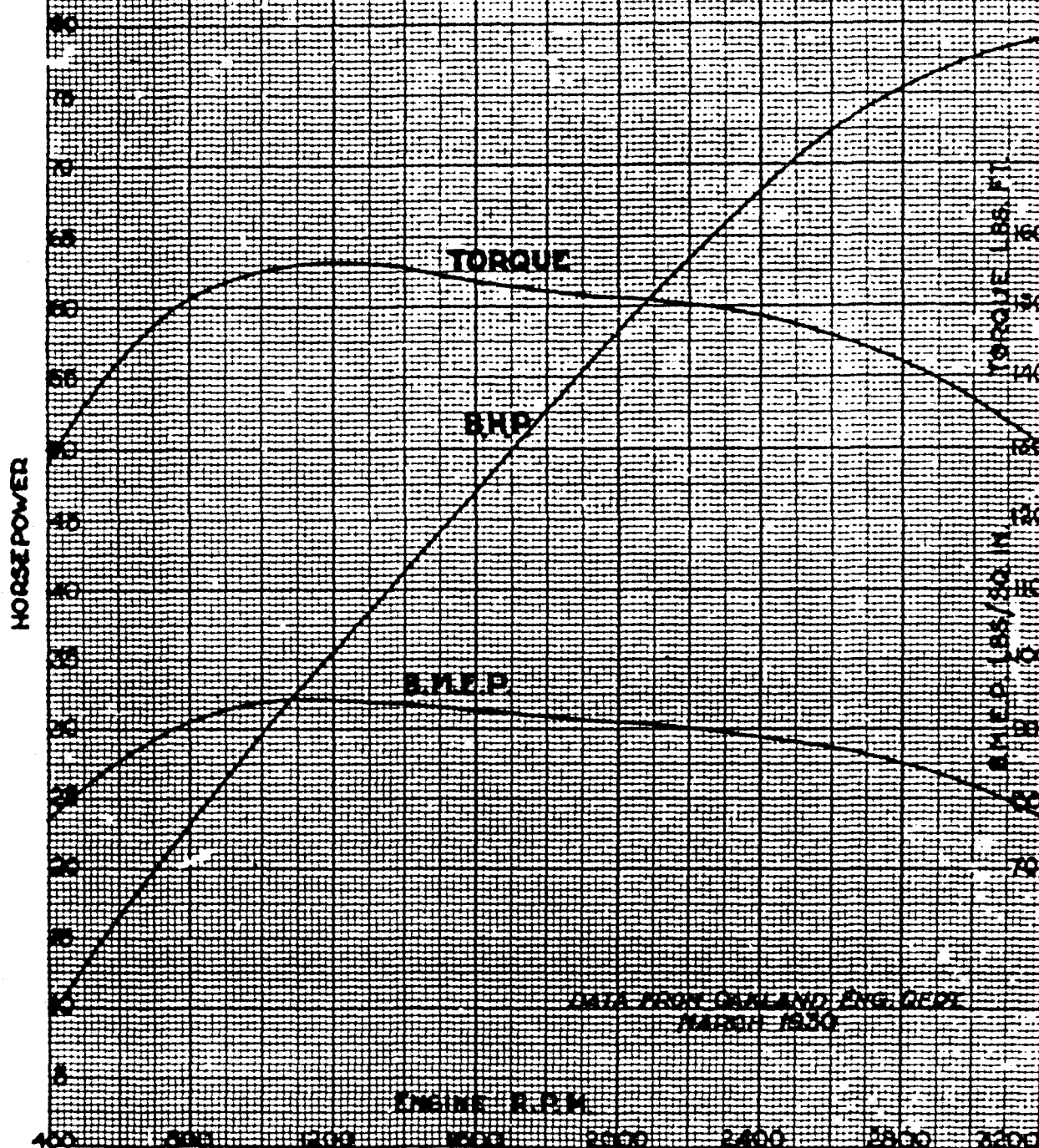
SIZE 8-3/4 x 3-3/4 DISP 251 CU IN.

COMP. RATIO 8.0-1 AVG COMP. PRESS (CORR) 108 LBS. SQ. IN. G.M. GA.

CORR. TO 29.92 BARO. AND 103°F.

TEST RUN WITHOUT MUFFLER, TAIL PIPE BUT WITH COOLING  
FAN, AIR CLEANER, GENERATOR, WATER AND OIL PUMPS

ENGINE FROM CAR 101-1



CAR	1930 Buick Series 40
WHEEL BASE	118
TIRES Size	29 x 5.50
Rolling Cir.	7.696
Make	Goodrich at 36 lbs.
ROAD CLEARANCE	8-9/16
TURNING RADIUS, R. & L.	19-3/4
CURB WEIGHTS Front	1873
Rear	1987
Total Road	3860
SPRINGS Front	Semi-Ell. 36-3/8 x 2
Rear	Semi-Ell. 55 x 2-1/4
ENGINE Size	3-7/16 x 4-5/8
Displacement	257.5
Weight	746 Less Oil
Max. B.H.P.	69 at 2800
Max. B.M.E.P.	101 at 900
Max. Torque	173 at 1200
Compression Ratio	4.5
Cylinder or piston offset	Piston Pin 3/32
Balancer	Yes
Counterbalanced	Yes
Main Bearings Length	2-1/4, 1-5/2, 1-11/16, 2-9/16
Main Bearing Diameter	2-3/8 All
Conn. Rod Bearings L. & D.	1-1/2 x 2-1/8
Conn. Rod Length	10
Piston Material	Cast Iron
Valves: Head Diameter	1.7157 Both
Port Diameter	1.5625 Both
Seat Angle	45°
Lift	.337
Lash (Hot)	.008
Valve Timing: IO	1° LTC
IC	51° ABC
EO	52° BBC
EC	23° LTC
Initial Spark Setting	15° Advance
Firing Order	1-4-2-6-3-5
Carburetor Make & Size	Marvel 1-7/16 Throttle Diam 1-1/4 Port Diam.
Oil Capacity	7-1/2 qts dry, 5-1/2 refill
Water Capacity	4 gallons
GEAR RATIOS: Low	3.070 to 1
Second	1.824 to 1
Reverse	3.684 to 1
Rear Axle	4.545 (50-11)

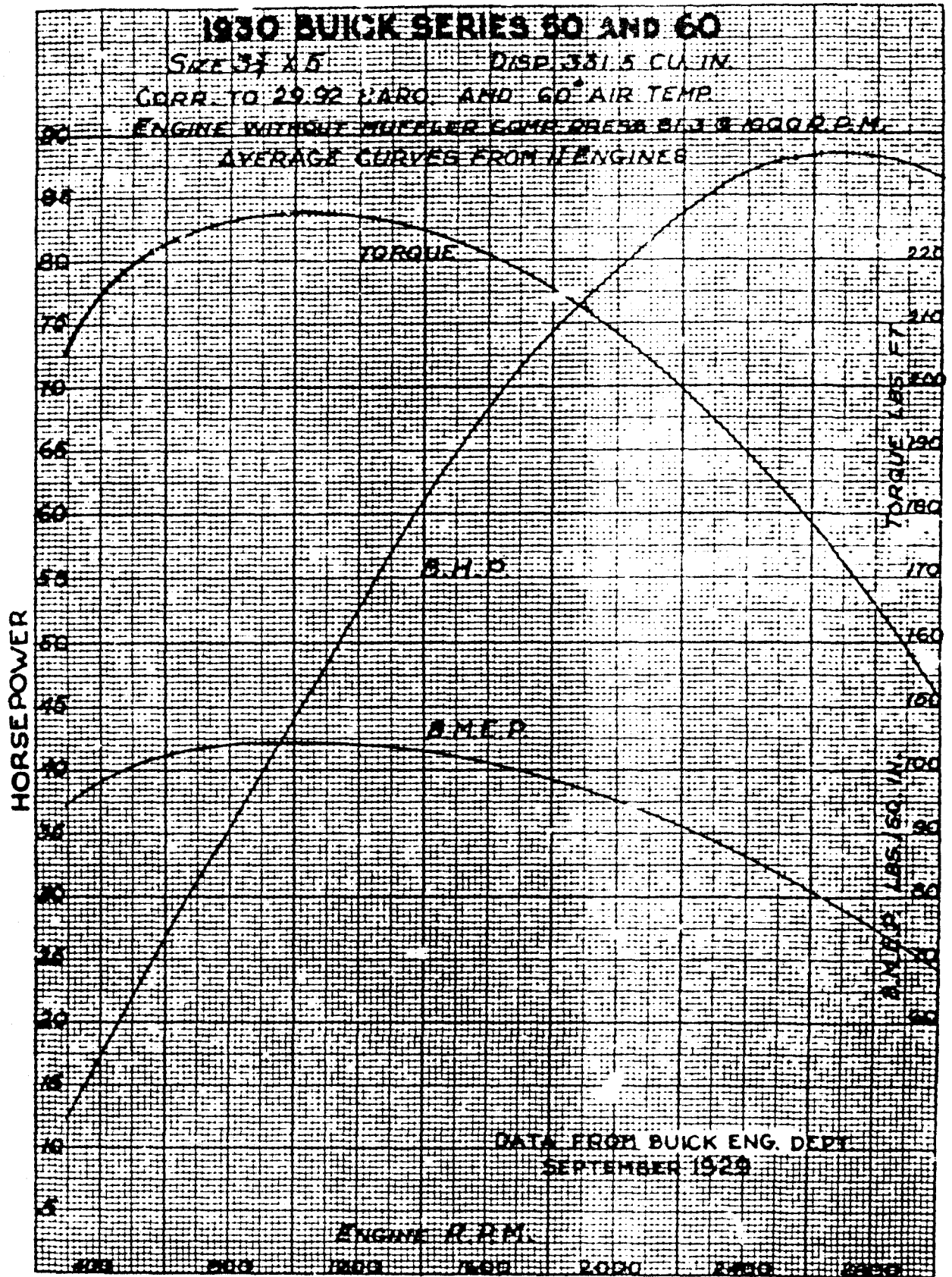
NOTES: Car weights from Buick for five passenger, 2-door sedan including gas, oil and water, spare tire, bumpers, tools, but no passengers. Engine weights include everything attached to engine as used in the car less transmission and clutch. B.H.P., B.M.E.P., and torque from curves in this book.

DATA from Buick Engineering Department, September 1929.

CAR		1930 Buick Series 50-60	
WHEELBASE		124 - 132	
TIRES Size		19 x 6.50	
Rolling Cir.		8.062	
Make		Firestone at 36 lbs.	
ROAD CLEARANCE		8-13/16	
TURNING RADIUS, R. & L.		21-3/8 - 22-3/4	
CURB WEIGHTS Front		M-57 2152 M-61 2236	
Rear		2366 2379	
Total Road		4512 4615	
SPRINGS Front		Semi-Ell. 37-1/8 x 2	
Rear		Semi-Ell. 58-1/4 x 2	
ENGINE Size		6 3-3/4 x 5	
Displacement		331	
Weight		906 Less Oil	
Max. B.H.P.		88 at 2800	
Max. B.M.E.P.		102 at 1200	
Max. Torque		226 at 1200	
Compression Ratio		4.35	
Cylinder or Piston Offset		Piston Pin 3/32	
Balancer		Yes	
Counterbalanced		Yes	
Main Bearing Length		2-7/16, 1-13/16, 1-7/8, 2-23/32	
Main Bearing Diam		2-1/2 .111	
Conn. Rod Bearings L. & D.		1-3/4 x 2-3/8	
Conn. Rod Length		11-1/4	
Piston Material		Cast Iron	
Valves: Head Diam		In. 2.028 Ex. 1.784	
Port Diam		In. 1.8755 Ex. 1.625	
Seat Angle		45°	
Lift		.537	
Lash (Hot)		.008	
Valve Timing: IO		17° 54' ATC	
IC		52° 30' ABC	
EO		50° 30' BBC	
EC		20° 4' ATC	
Initial Spark Setting		17° Advance	
Firing Order		1-4-2-6-3-5	
Carburetor Make & Size		Marvel 1-3/4 Throttle Diam. 1-1/2 Man. Diam.	
Oil Capacity		8 qts dry 6 qts. refill	
Water Capacity		5-1/2 gallons	
GEAR RATIOS: Low		3.091	
Second		1.794	
Reverse		3.915	
Rear Axle		M-57 (47-11) 4.272 M-61 (49-11) 4.455	

NOTES: Car weights from Buick for five passenger 4-door sedan including gas, oil, water, spare tire, bumpers and tools but no passengers. M-61 for 7 passenger sedan. Engine weights include everything attached to engine as used in the car less transmission and clutch. B.M.E.P. B.H.P., and torque figures from performance curves in this book.

DATA from Buick Engineering Department, September 1929.



CAR		1930 VIKING	
WHEELBASE		125	
TIRES Size		30 x 6.00	
Rolling Cir.		7.48	
Make		35 lbs. rear & 40 lbs. front	
ROAD CLEARANCE		8	
TURNING RADIUS, R. & L.		21-1/4	
WEIGHTS Front		1795	
Rear		2037	
Total Road		3832	
SPRINGS Front		Semi-Ell. 37" x 2"	
Rear		Semi-Ell. 58" x 2"	
ENGINE Size		V-8 3-3/8 x 3-5/8	
Displacement		259.5	
Weight		700 lbs.	
Max. B. H. P.		81 at 3200	
Max. B.M.E.P.		102.75 at 1200	
Max. Torque		176 at 1200	
Compression Ratio		5.1	
Cylinder Offset		None	
Balancer		No	
Counterbalanced		Yes 100%	
Main Bearings Length		1-7/8, 2-1/2, 3-3/8	
Main Bearing Diameter		2-1/4, 2-3/8, 2-1/2	
Conn. Rod Bearing L & Dia		1-3/8 x 2	
Connecting Rod Length		7-1/8	
Piston Material		Cast Iron	
Valves: Head Diam.		In. 1-15/32	Ex. 1-11/32
Port Diam.		In. 1-5/16	Ex. 1-3/16
Seat Angle		In. 30°	Ex. 30°
Lift		In. .340	Ex. .336
Lash		In. .008	Ex. .010
Valve Timing: IO		1° - 20' BTC	
IC		51° - 20' ABC	
(.010 Lash) EO		41° - 20' EBC	
EC		11 - 20' ATC	
Initial Spark Setting		.055 BTC	
Firing Order		1R-4L-4R-2R-3L-3R-2L-1L	
Carburetor Make & Size		Johnson 1-1/2	
Oil Capacity		7 qts.	
Water Capacity		32 qts.	
GEAR RATIOS: Low		3.11	
Second		1.69	
Reverse		3.78	
Rear Axle		4.63 (11-51)	

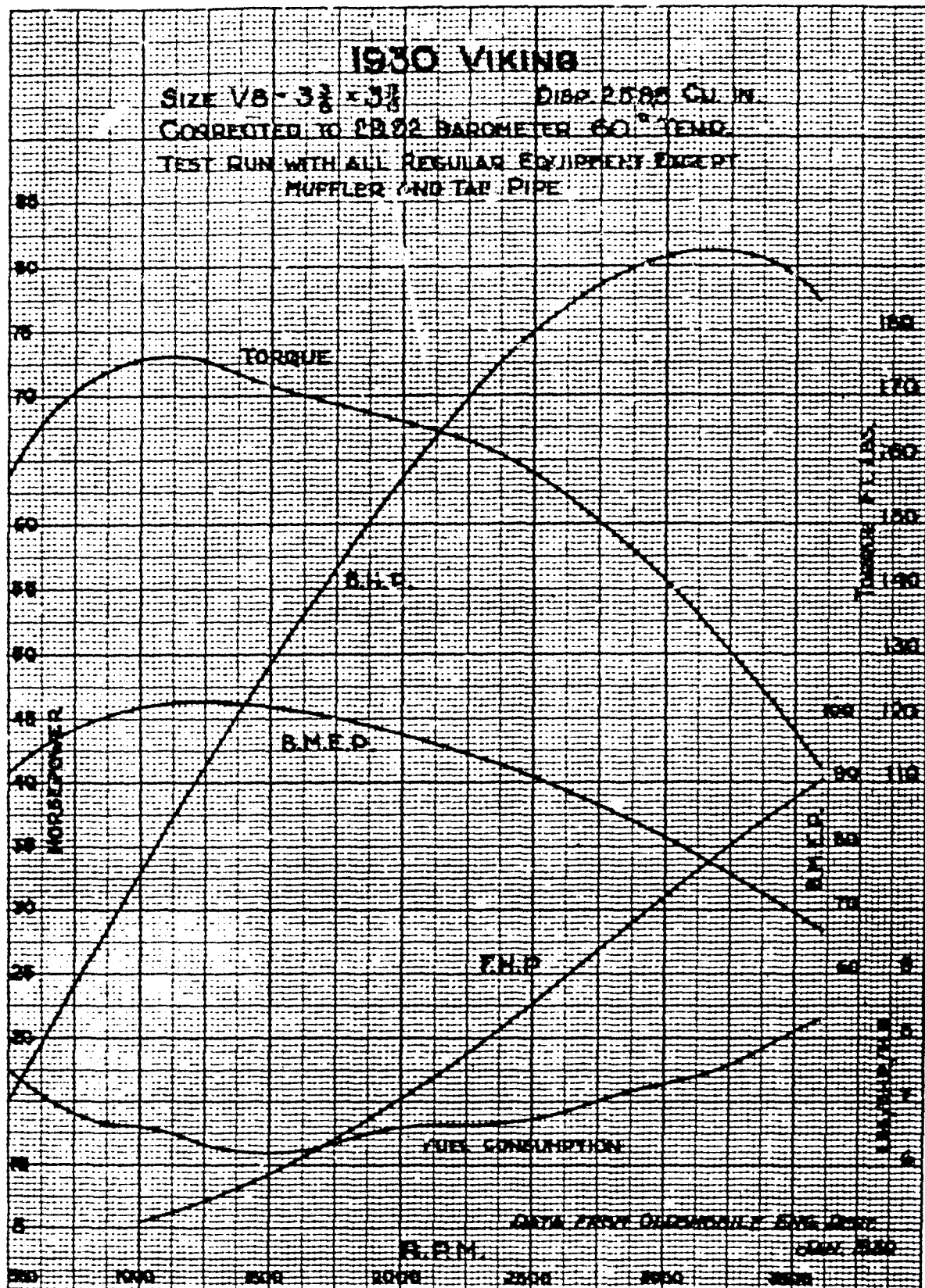
NOTES: Engine weight complete except transmission, clutch and housing. Car Weight from Oldsmobile for 4-door 5-passenger sedan including gas, oil and water, spare tire, bumpers and tools but no passengers. Torque, B.H.P and B.M.E.P values from performance curves in this book.

DATA from Oldsmobile Engineering Department, January 1930.

EUGENE DIEZGEN CO CORP  
CHICAGO AND NEW YORK 1922

EDCO ENGINEERING  
20 X 20

NO 340 20

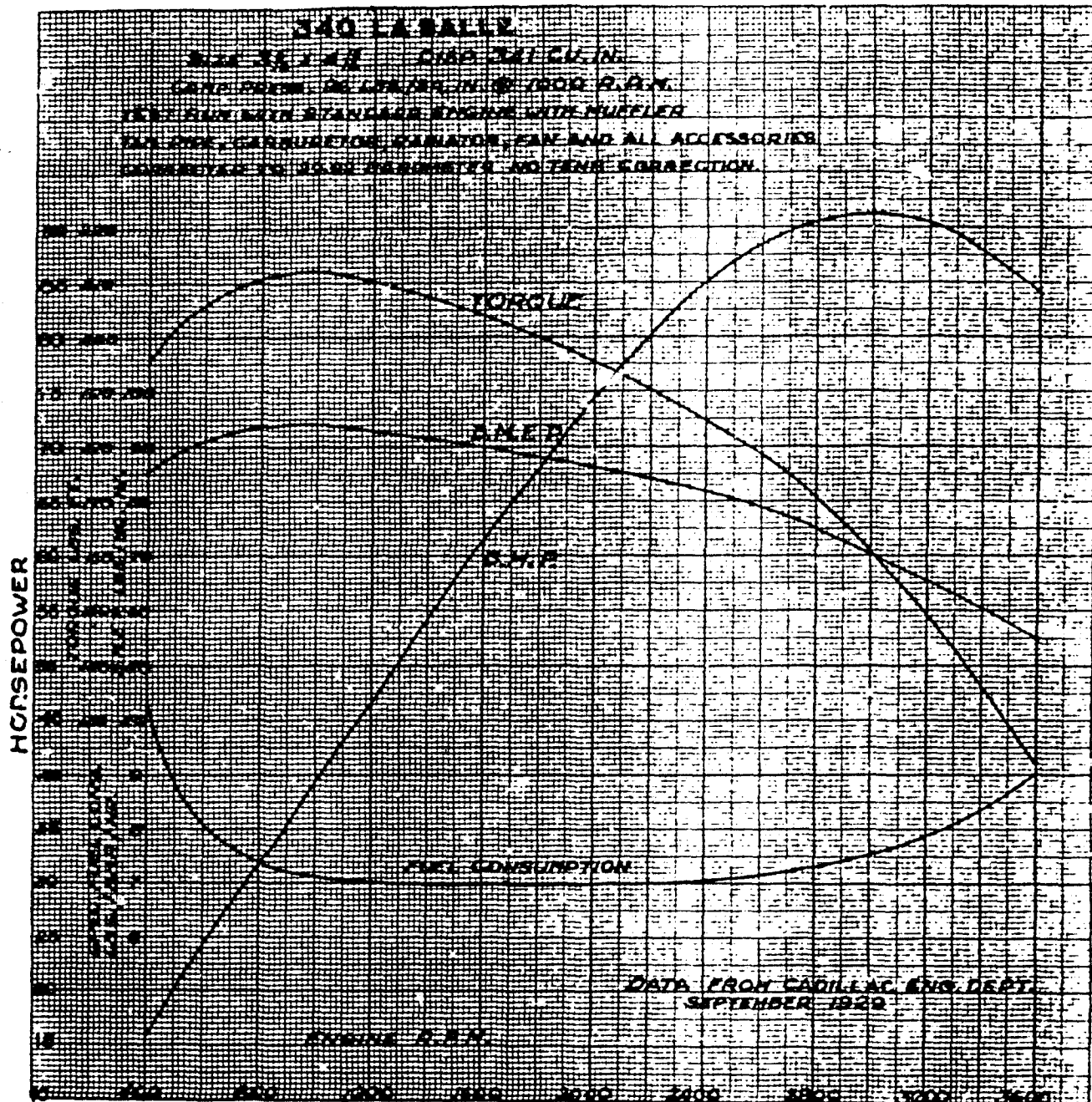


CAR	1930 LaSalle 340
WHEELBASE	134
TIRES Size	6.50 - 19 Wood Wheels 7.00 - 18 others
Rolling Cir.	7.925
Make	U.S. at 40 lbs. 7.00-18
ROAD CLEARANCE	7-23/32
TURNING RADIUS	R. 23' - 1", L. 24' - 6"
WEIGHTS Front	2234
Rear	2733
Total Road	4967
SPRINGS Front	Semi-Ell. 38 x 2
Rear	Semi-Ell. 56 x 2
ENGINE Size	V-8 - 3-5/16 x 4-15/16
Displacement	341
Weight	701.5
Max. B.H.P.	91.5 at 3000
Max. B.M.E.P.	94 at 900
Max. Torque	211 at 900
Compression Ratio	5.18 Std. 4.92 Opt.
Cylinder Offset	None
Balancer	No
Counterbalanced	Yes
Main Bearings Length	1-5/16, 1-5/8, 2-7/8
Main Bearing Dia.	2-3/8
Conn. Rod Bearing L. & Dia.	1-3/8 x 2-3/8
Connecting Rod Length	10-1/2
Piston Material	Nickel Cast Iron
Valves: Head Diam.	In. 1.66 Ex. 1.63
Port Diam.	In.
Seat Angle	In. 30° Ex. 45°
Lift	23/64
Lash (Cold)	In. .004 Ex. .006
Valve Timing: IO	11° BTC
IC	59° ABC
EO	48° BBC
EC	8° ATC
Initial Spark Setting	7° 20' ETC
Firing Order	1R-4L-4R-2R-3L-3R-2L-1L
Carburetor Make & Size	Ow 2"
Oil Capacity	8 qts.
Water Capacity	6 gallons
GEAR RATIOS: Low	2.96
Second	1.79
Reverse	3.56
Rear Axle (59-13)	4.54 Std., 4.07, 4.91 Opt.

NOTES: Car weights of 4-door 5-passenger sedan including gas, oil, water, spare tire, bumpers and tools, but without passengers. Weights from Cadillac Engineering Dept. Engine weight includes everything attached to engine as used in a car less transmission, clutch and starter. Starter weighs 25 lbs.

B.H.P., B.M.E.P., and torque values from curves in this book. DATA from Cadillac Engineering Department, December 1929.





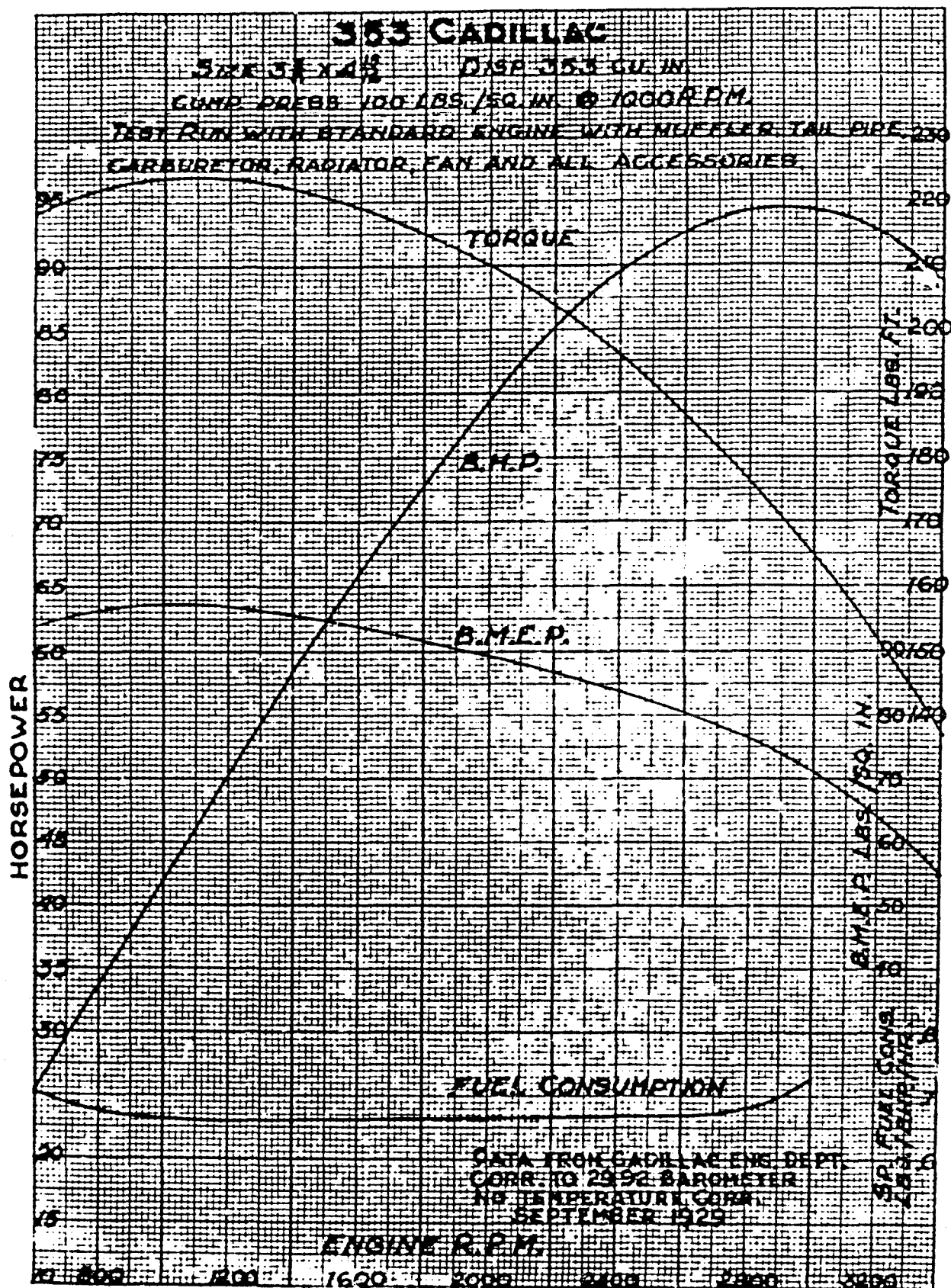


CAR 1930 CADILLAC 353

WHEELBASE	140
TIRES Size	7.00 - 19
Rolling Cir.	8.20
Make	U.S. Royal at 40 lbs.
ROAD CLEARANCE	8-3/8
TURNING RADIUS	R. 26' - 10", L. 24' - 6-1/2"
WEIGHTS Front	2770
Rear	2869
Total Road	5639
SPRINGS Front	Semi-Ell. 42 x 2-1/4
Rear	Semi-Ell. 60 x 2-1/2
ENGINE Size	V-8 3-3/8 x 4-15/16
Displacement	353 cu. in.
Weight	697.5 lbs.
Max. B.H.P.	94.5 at 2900
Max. B.M.E.P.	97 at 1000
Max. Torque	224 at 1000
Compression Ratio	5.15 Std., 5.03 Opt.
Cylinder Offset	None
Balancer	No
Counterbalanced	Yes
Main Bearings Length	1-5/16, 1-5/8, 3/8
Main Bearing Dia.	2-3/8
Conn. Rod Bearings L. & Dia.	1-3/8 x 2-3/8
Connecting Rod Length	10-1/2
Piston Material	Nickel Cast Iron
Valves: Head Diam.	In. 1.66 Ex. 1.63
Port Diam.	
Seat Angle	In. 30° Ex. 45°
Lift	23/64
Lash (Cold)	In. .004 Ex. .006
Valve Timing: IO	11° BTC
IC	59° ABC
EO	48° BBC
EC	8° ATC
Initial Spark Setting	7° 20' BTC
Firing Order	1R-4L-4R-2R-3L-3R-2L-1L
Carburetor Make & Size	Own 2"
Oil Capacity	8 qts.
Water Capacity	6 gallons
GEAR RATIO: Low	2.96
Second	1.79
Reverse	3.56
Rear Axle (61-12)	5.06 Std. 4.39, 4.75 Opt.

NOTES: Car weight of 4-door 5-passenger sedan, with wire wheels including gas, oil and water, spare tire, bumpers and tools, but without passengers. Weights from Cadillac Engineering Dept. Engine weight includes everything attached to engine as used in car except transmission, clutch and starter. Starter weighs 25 lbs. B.H.P., B.M.E.P., and torque values from curves in this book.

DATA from Cadillac Engineering Department, December 1929.

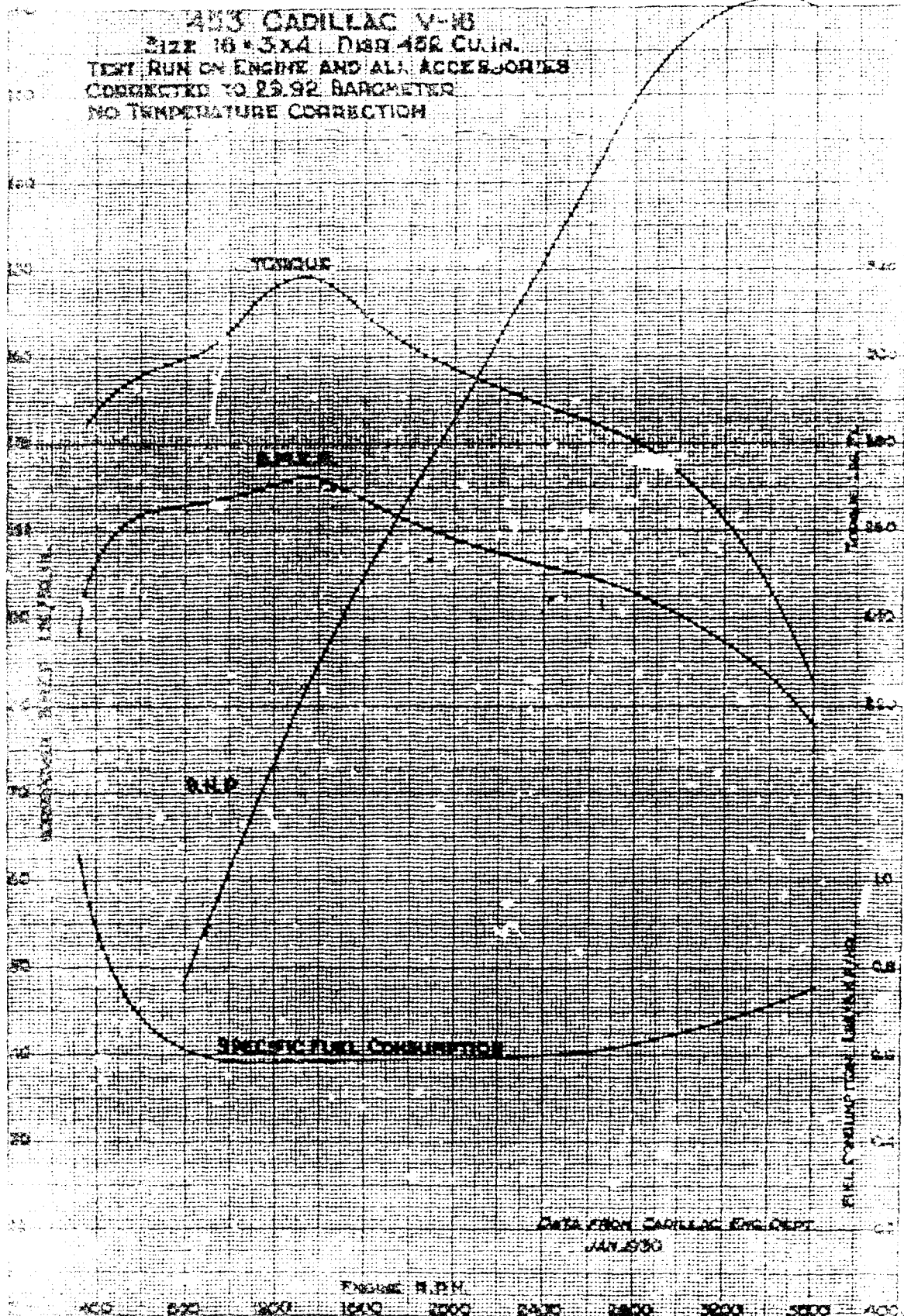


CAR	CADILLAC 452
WHEELBASE	148
TIRES Size	7.00 - 19
Rolling Cir.	8.20
Make	U.S., Goodyear, Firestone,
	F. 45-lbs. R-40 lbs
ROAD CLEARANCE	8-3/8
TURNING RADIUS	
WEIGHTS Front	
Rear	
Total Road	
SPRINGS Front	Semi-Ell. 42 x 2-1/4
Rear	Semi-Ell. 60 x 2-1/2
ENGINE Size	16-3 x 4
Displacement	452
Weight	
Max. B.H.P.	161 at 3400
Max. B.M.E.P.	106 at 1400
Max. Torque	318 at 1400
Compression Ratio	5.5
Cylinder Offset	None
Balancer	Yes
Counterbalanced	Yes
Main Bearings Length	2-3/16, 1-3/8, 1-1/2, 1-3/8, 3-9/16
Main Bearing Diam	2-5/8
Conn. Rod Bearings L. & D.	1-1/32 x 2-1/2
Connecting Rod Length	9.25
Piston Material	Nickel Cast Iron
Valves: Head Diam.	1.45
Port Diam.	
Seat Angle	45°
Lift	11/32
Lash (Hot)	0
Valve Timing: IO	TDC
IC	44° ABC
O Lash	EO 39° BBC
EC	5° ATC
Initial Spark Setting	10-1/2° BTC
Firing Order	1-8-9-14-3-6-11-2-15-10-7-4-13-12-5-16
Carburetor Make & Size	Own Two 1-1/2"
Oil Capacity	10 qts.
Water Capacity	7 gallons
GEAR RATIOS: Low	1.51
Second	2.50
Reverse	3.00
Rear Axle (57-13)	4.39 Opt. 4.75, 3147, 4.C7

NOTES: Cylinder Numbers Front 2-4-6-8-10-12-14-16  
1-3-5-7-9-11-13-15

Torque, B.M.E.P. and B.H.P. values from curves in this book.

DATA from Cadillac Engineering Department, December 1929.



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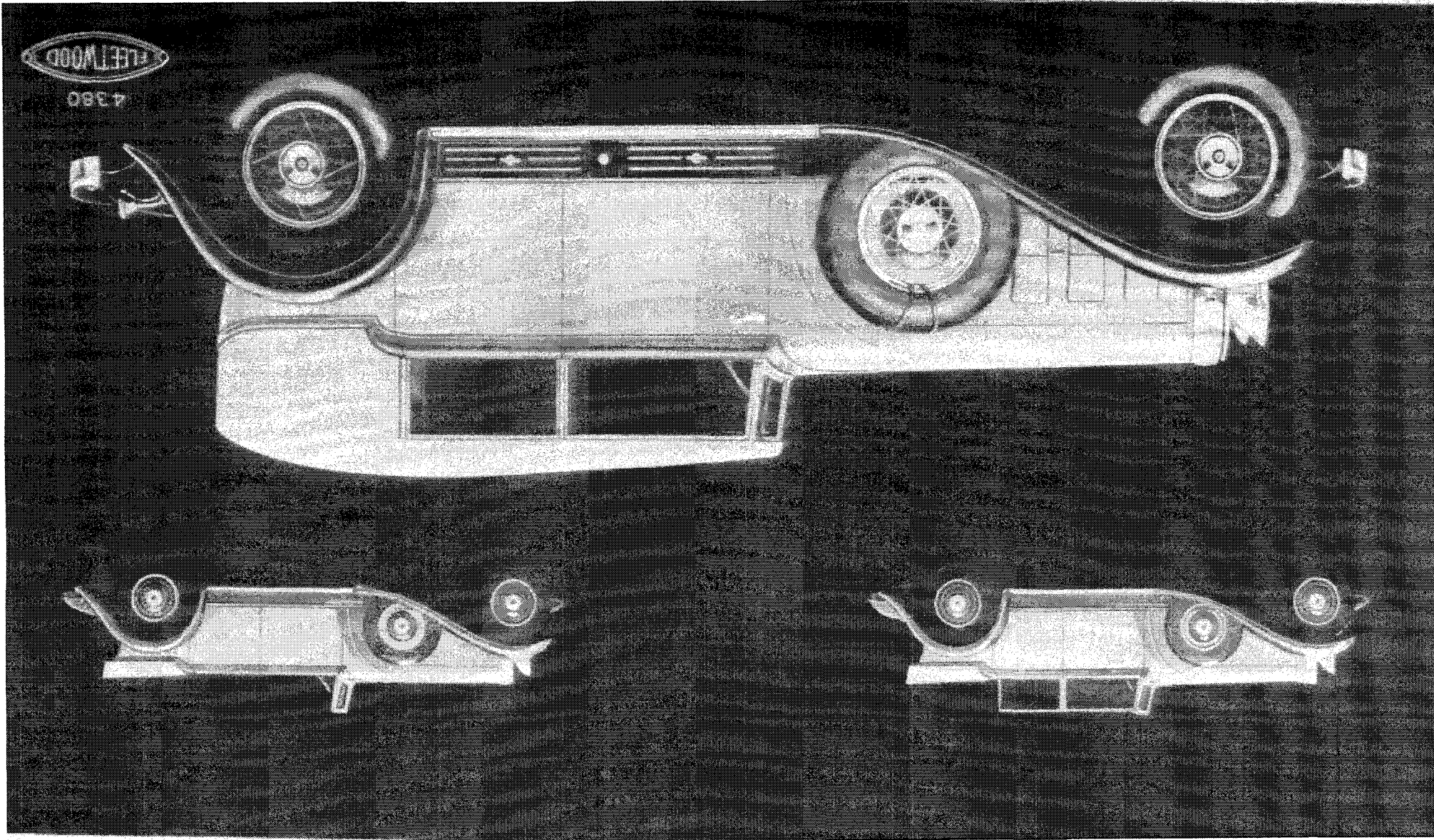
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July 1929



1930 Cadillac All-Weather Phaeton Style No 4380



# Transformable Limousine Brougham

Style No. 4391

*Rear Quarters:* Metal with quarter windows.

*Extra Seats:* Two extra wide, facing forward, without arms, upholstered with springs—semi-concealed.

*Windshield:* Solid bronze frame, chrome finish, V-type sloping, clear vision, non-glare, Security-Plate glass.

*Ventilators:* One top, one each side of cowl.

*Lighting:* One dome light combined with ventilator, two corner lights, two step lights for rear doors.

*Windows:* All doors and division drop flush with mouldings. Rear quarter, part way. Security-Plate glass.

*Hardware:* Fleetwood design, chrome plated.

*Toilet Cases:* Combination quarter window panel and vanity case with imported 8-day clock, two ash trays, mirror and cigarette case. Combination quarter window panel and smoking case, two ash trays and cigar lighter.

*Interior Finish Panels:* Walnut with burl inlay and ebony inlaid stripe on rear doors, quarter windows and division.

*Foot Cushions:* Spring type, carpet-covered, padded, combining foot rest and hassock features.

*Driver's Roof Curtain:* Driver's roof and side supports can be removed and carried under front seat.

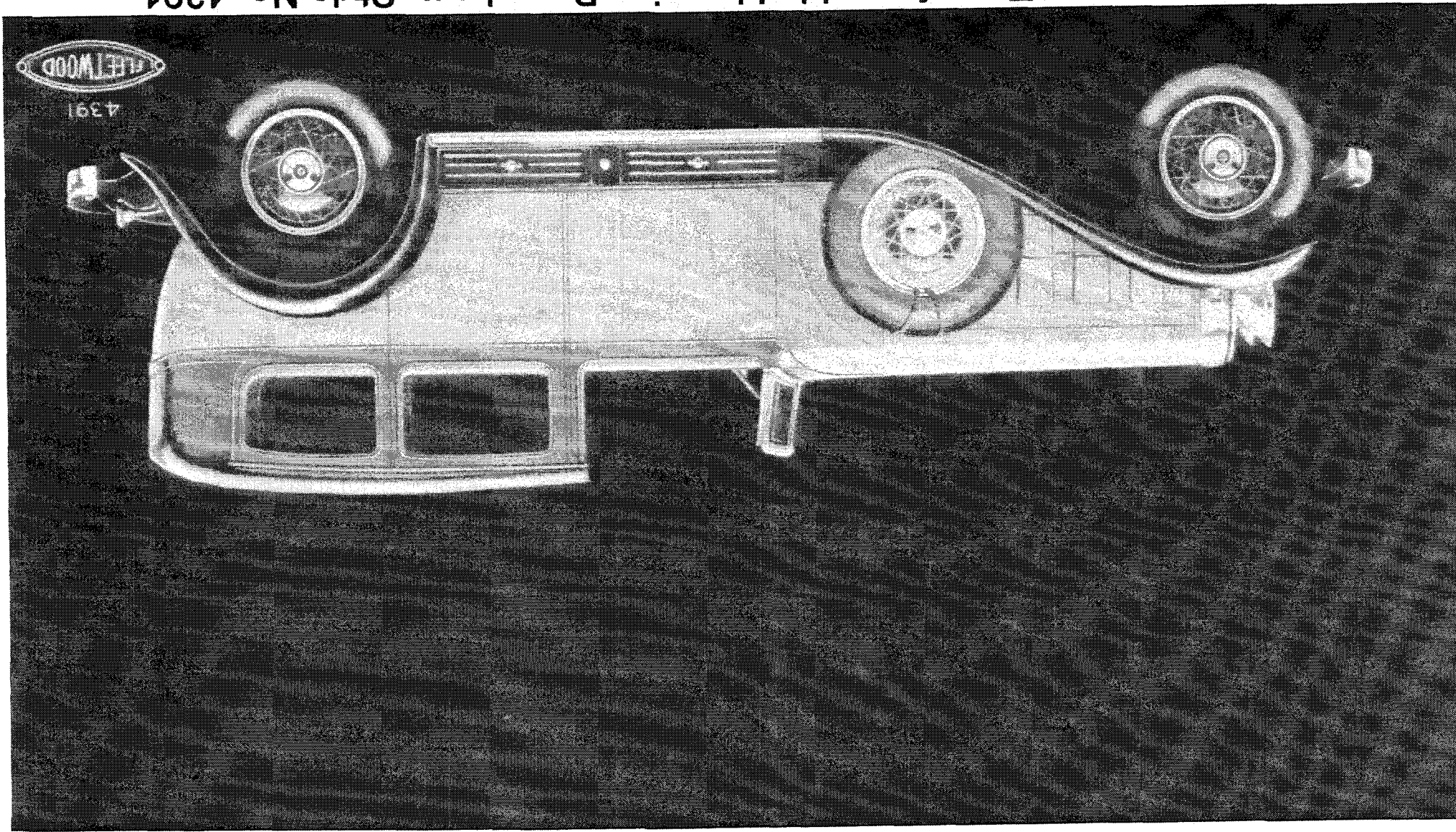
*Telephone:* Right side of rear seat.

*Silk Curtains:* All windows in rear compartment including center partition.

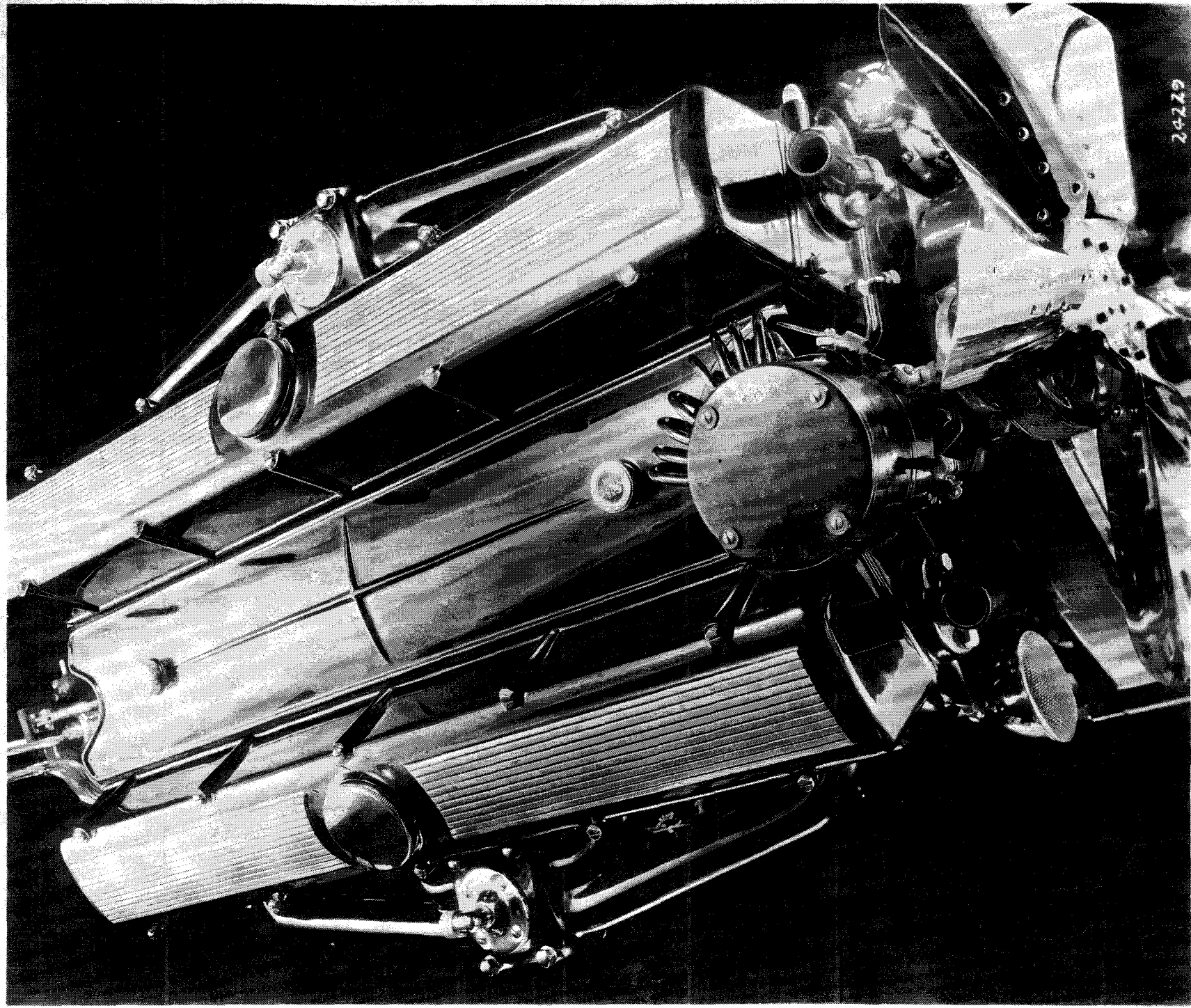
*Side Arm Rests:* Combination side arm rest and concealed pocket. Access is gained to pocket by raising top pad of arm rest.

Robe cord. Silk umbrella. Folding arm rest center rear seat. Wired for radio. Luggage carrier and sheepskin mat in rear compartment. Adjustable rear seat back and rear cushion.

1930 Cadillac Transformable Limousine Brougham Style No. 4391







24229

Cadillac V-16 Engine

1930-1931

## Upholstery Selections

### Enclosed Drive and Transformable Type

### *Fleetwood 16-Cylinder Jobs*

#### BROADCLOTHS

<i>Wiese No.</i>	<i>Color</i>
2969	Green Gray
2970	Maroon Taupe
2971	Tan
2972	Silver Gray
2973	Blue Gray
2994	Tan Taupe
3288	Dark Gray
3363	Dark Taupe
3807	Mouse Gray
3833	Gray Pattern
3834	Green Pattern
3835	Taupe Pattern

#### BEDFORD CORD COMBINATION

<i>Bedford Cord Wiese No.</i>	<i>Headlining Wiese No.</i>	
3899	2969	Green Gray
3898	2970	Maroon Taupe
3897	3807	Mouse Gray
2526	3896	Sand

#### MOHAIRS

108T	Green
109T	Gray
110T	Taupe

#### SPECIAL RADEL AERO LEATHERS Optional in All-Weather Phaeton and Open Types

<i>Number</i>	<i>Color</i>
5885	Silver Gray
451	Pearl Gray
2646	Blue Gray
5897	Green Blue
68	Blue
6016	Dark Blue
9205	Deep Maroon
5875	Rich Maroon
4339	Green
6019	Soft Green
6012	Dark Green
9128	Light Brown
9131	Dark Brown
743	Tan
2645	Black

#### SPECIAL WATERPROOF WIESE BEDFORD CORDS Optional in All-Weather Phaeton

Wiese	2659-F	2759-F	Green Gray
Wiese	2661-F	2761-F	Brown Gray
Wiese	2662-F	2672-F	Gray
Wiese	2663-F	2763-F	Blue Gray
Wiese	2665-F	2765-F	Maroon Taupe
Wiese	2666-F	2766-F	Tan Taupe



## BODY STYLE OPTIONS

**The Town Car models can be had with collapsible rear quarters.**

**Extra charges are:**

[illegible]

The same feature can be had on all Sedans and Imperials for the following extra charges:

[illegible]

*Note: Prices apply only before metal has been built on wood frame. If collapsible rear quarter is wanted on body already "in metal," individual price quotation is necessary. Delivery time—4 weeks additional.*

*Back windows—Special size or shape* - - - - - \$125

*Quarter windows*—Special size or shape - - - - - 250

[illegible]

Without quarter window (4375 or 4375-S only) three weeks' additional time	-	-	-	-	300
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[illegible]

*Opera seats*—Instead of forward facing, in 4375, 4375-S, 4320, 4325, 4391 - - - - - 125

[illegible]

In Five-Passenger Sedans - - - - - 128

<i>Sliding glass division</i> —In Imperials and Town Cars with standard auxiliary seats	-	-	-	-	150
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[illegible]

<i>Radel Aero Leather</i> —Transformables and enclosed drive types, front and rear cushions, balance broad cloth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No charge
Seat cushions and up to belt	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	\$ 50
Entire interior, front and rear	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	150
Colored, for All-Weather Phaetons and open types (other than four standard colors) in Aero leather book, four weeks' additional time	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No charge
<i>Cushions</i> —Any height, slope, or depth; provided orders are received before body goes into trim and standard seat box can be used	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No charge
<i>Lap robes</i> —Monogrammed, crushed plush backing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	\$ 80 (Up)
<i>Pockets</i> —Flush type not possible. Envelope type attached on all doors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	\$ 75
<i>Down pillow</i> —Not standard, if desired	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18

#### EQUIPMENT OPTIONS

<i>Mats</i> —Rubber for front compartment all types	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	\$ 18
<i>Extra carpet</i> —For rear or front compartment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25
<i>Hardware</i> —Colored to match upholstery	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25
Other finishes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	\$ 25 (Up)
Special design	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	On quotation
<i>Vanity and smoking sets</i> —For All-Weather types, attached to division:																	
Vanity	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	\$ 55
Smoking	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26
Special finish	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	On quotation
<i>Inside mouldings</i> —To match vanity cases in special finish	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	\$ 35 (Up)
<i>Robe rails</i> —																	
Bar type Ducoed to match upholstery. (Must be ordered before body leaves factory)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No charge
Cord type to match upholstery. (Must be ordered before body leaves factory)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No charge
<i>Ash receivers</i> —Flush type for front doors where not standard	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	\$ 15
<i>Division clock</i> —Where not regular equipment, French walnut case	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40

*Note:* All of the above extra charges are *list*, subject to special discount applying on extra charges covering special features on Fleetwood line.

# Five-Passenger Sedan

*Style No. 4130-S*

*Rear Quarters:* Metal with quarter windows.

*Front Seat:* Entire seat adjustable.

*Windshield:* Perpendicular V-front. Swing-out type, frame painted, inner frames chrome. Security-Plate glass.

*Ventilators:* Two on top of cowl, one on each side of cowl.

*Lighting:* One dome light combined with ventilator, two corner lights, two step lights for rear doors.

*Windows:* All doors drop flush with mouldings. Rear quarter, part way. Security-Plate glass.

*Hardware:* Fleetwood design, chrome plated.

*Toilet Cases:* Vanity case with imported 8-day clock, two ash trays, mirror and cigarette case. Smoking case with two ash trays and cigar lighter.

*Side Arm Rests:* Combination side arm rest and concealed pocket. Access is gained to pocket by raising top pad of arm rest.

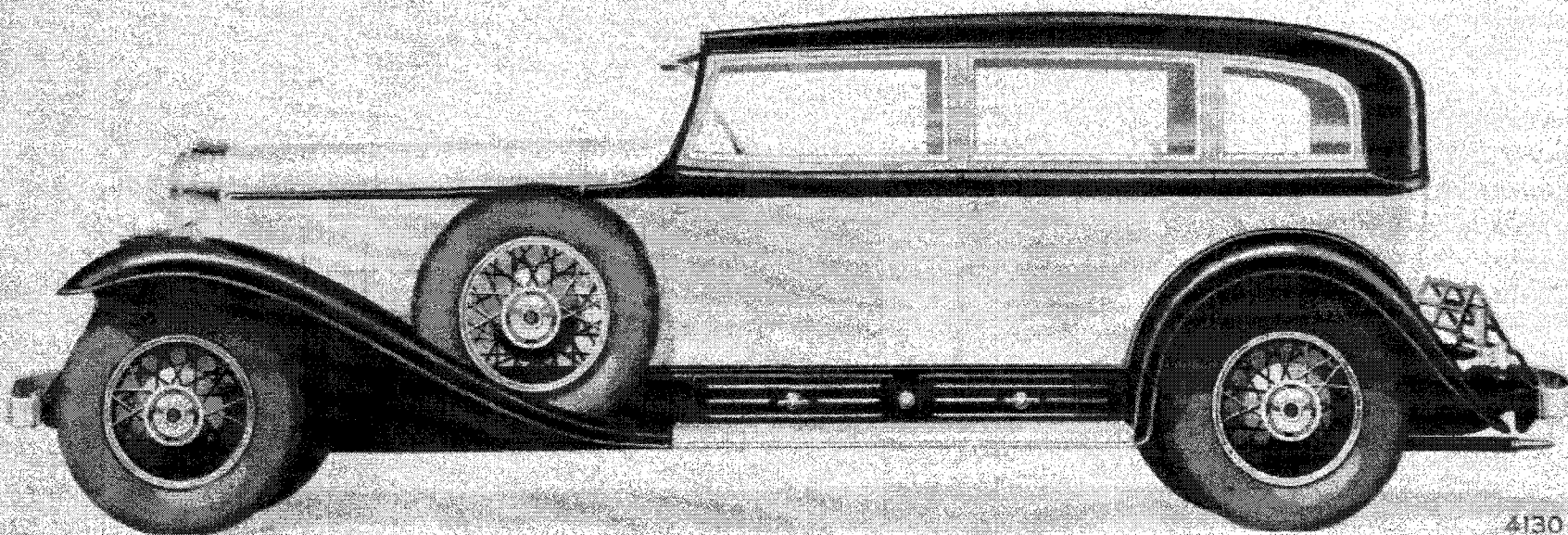
*Foot Cushions:* Spring type, padded, combining foot rest and hassock features.

*Window Reveals:* Chrome plated.

Robe rail. Center folding arm rest. Arm slings. Wired for radio. Adjustable rear seat back and cushion.

Note: Ten (10) more jobs available with perpendicular V-type shield, balance with straight slanting shield. Fisher VV-type.

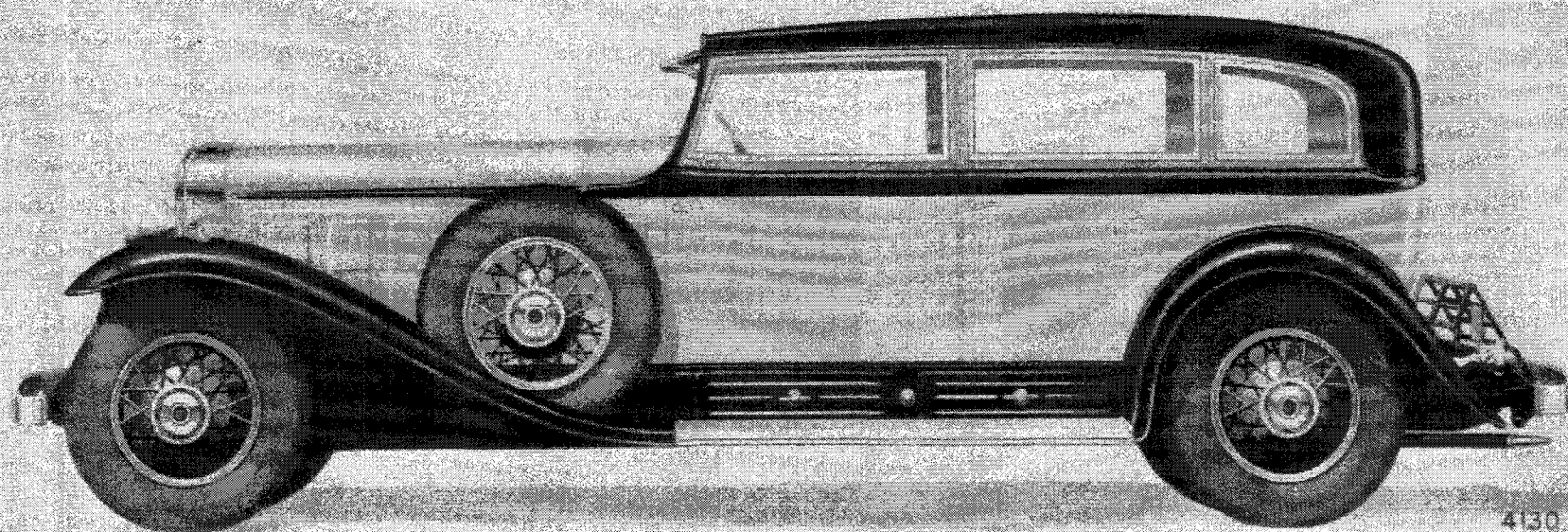




4130-S  
SLANTING WINDSHIELD



**1930 Cadillac Style No. 4130-S Slanting Windshield**

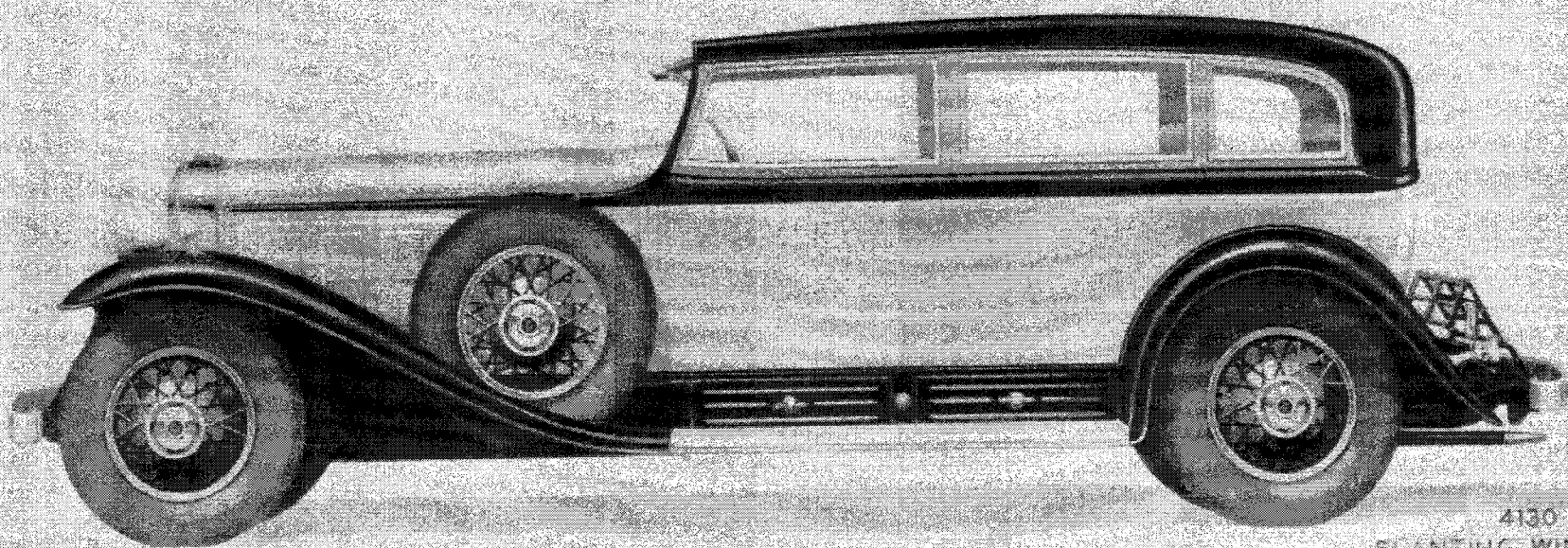


4130  
SLANTING WINDSHIELD



**1930 Cadillac V-16 Style No. 4130 Slanting Windshield**



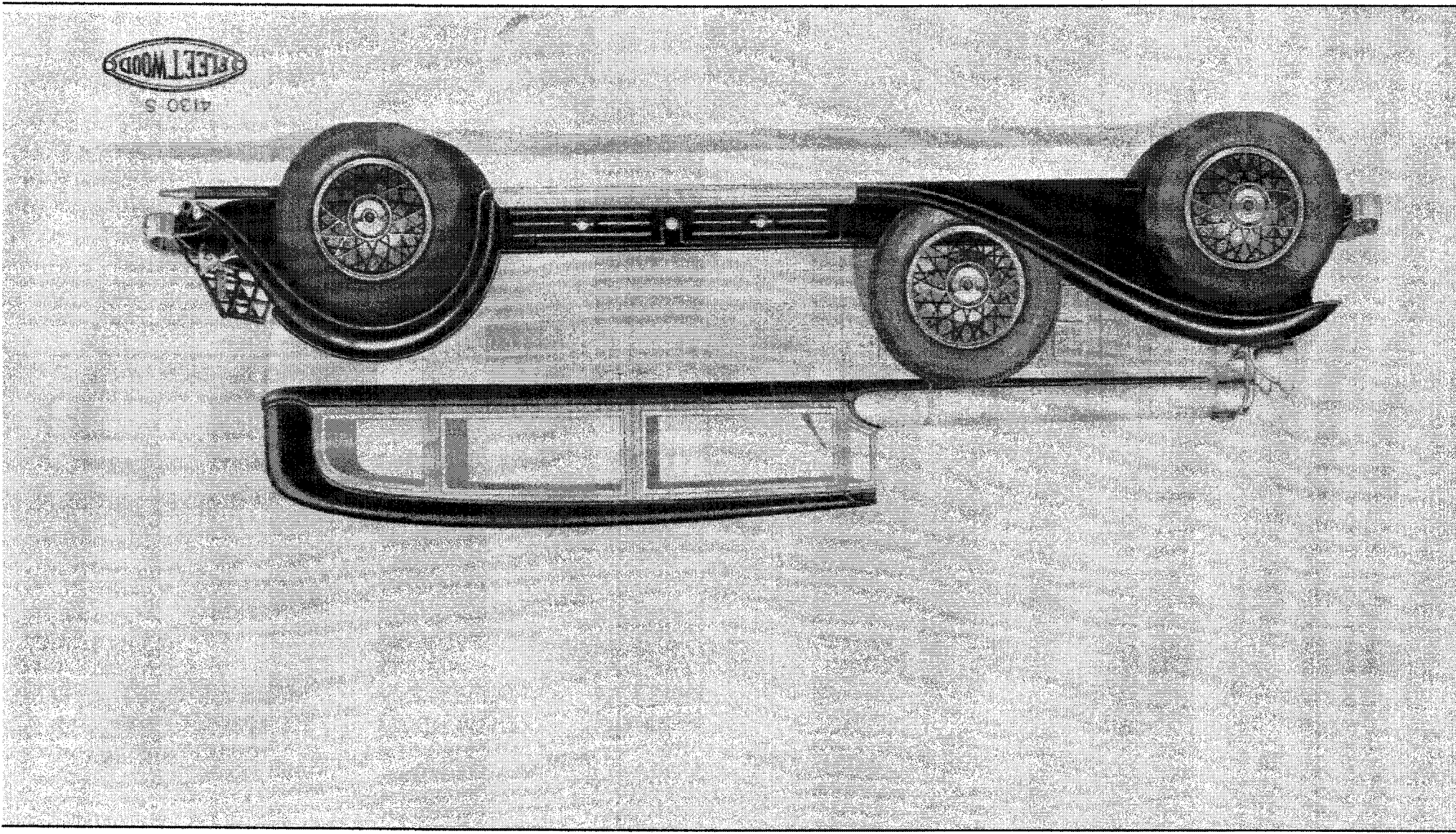


4130  
SLANTING WINDSHIELD



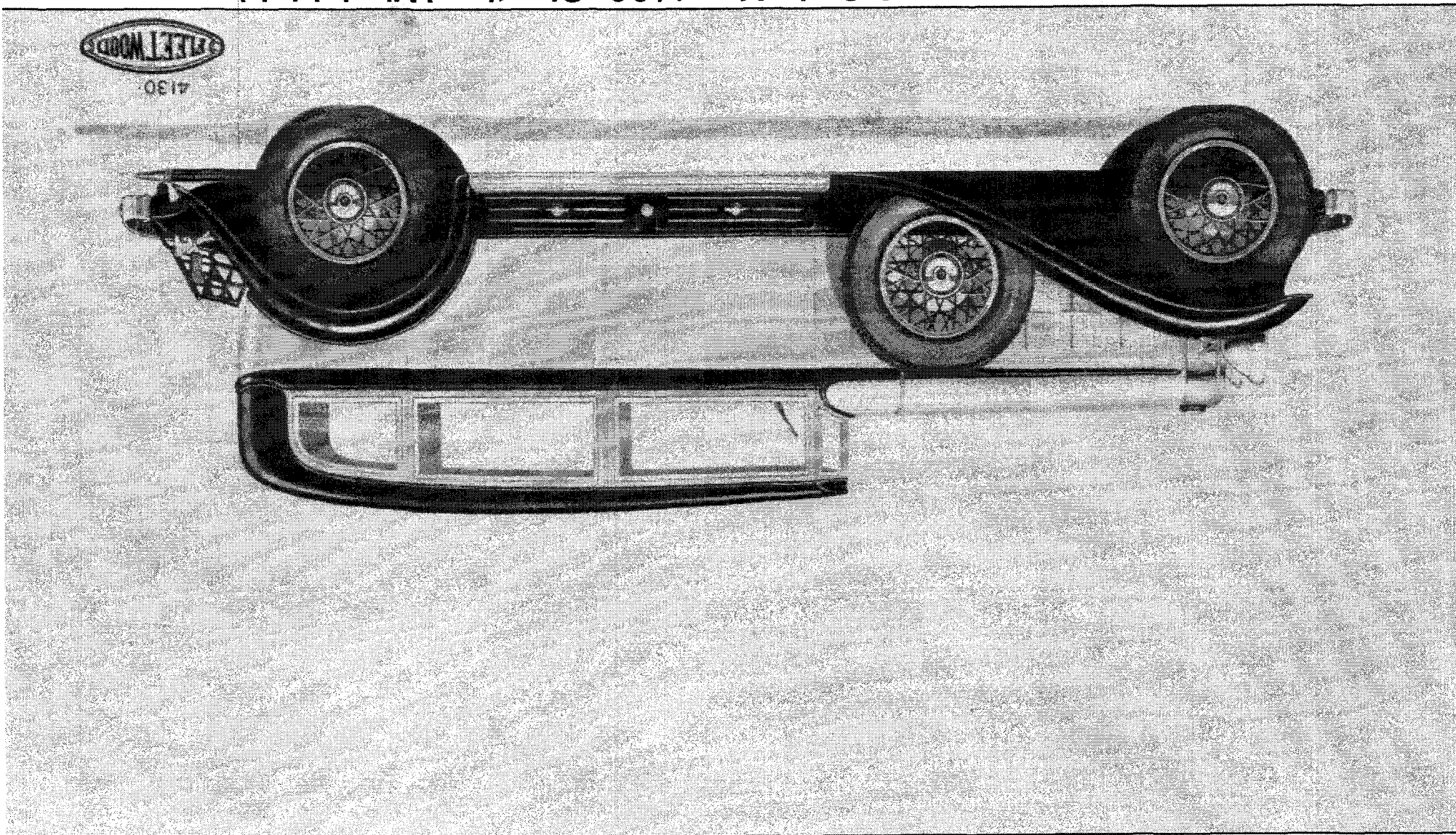
**1930 Cadillac Style No. 4130 Slanting Windshield**

1930 Cadillac V-16 Style No. 4130-S Standing Windshield

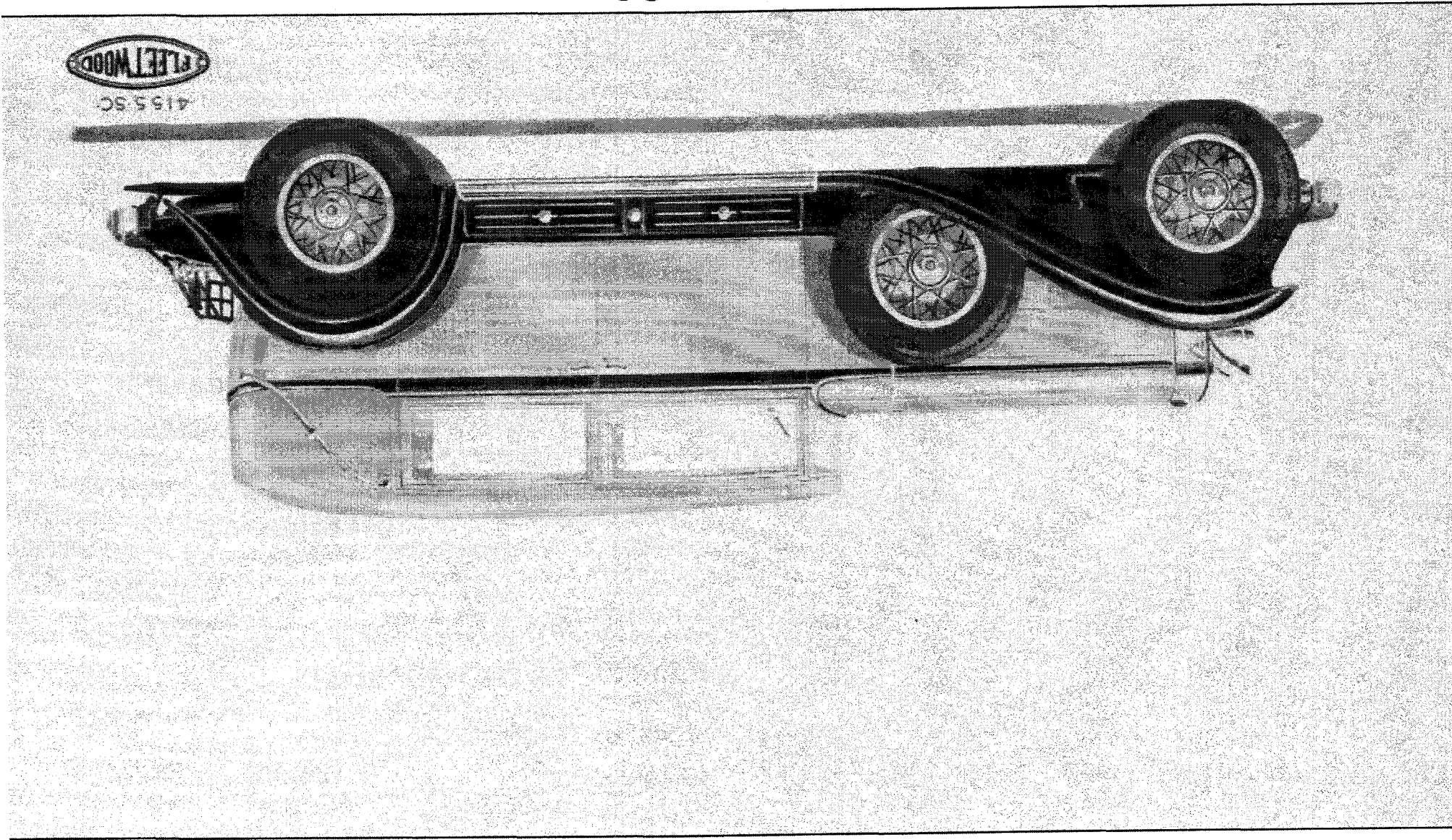




1930 Cadillac V-16 Style No. 4130 ~~Standard Windshield~~

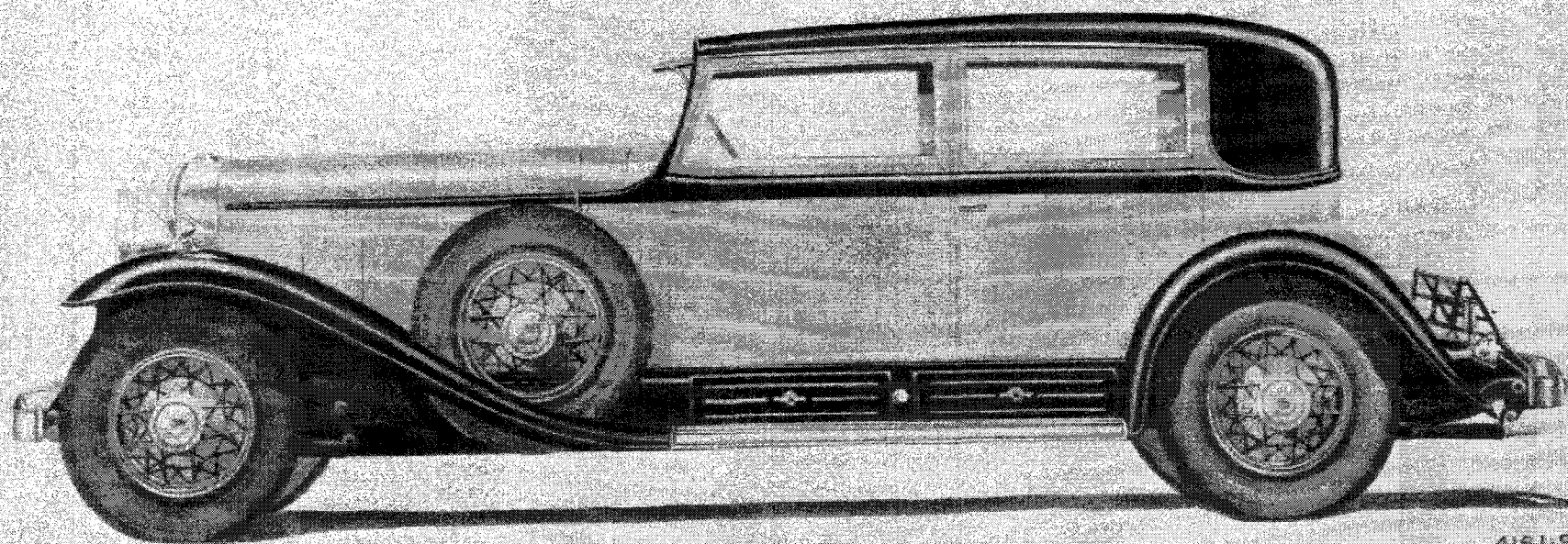


1930 Cadillac Style No. 4155-SC



4155-SC  
FLEETWOOD





4161-S  
FLEETWOOD

1930 Cadillac Style No. 4161-S

# Seven-Passenger Imperial

*Style No. 4175*

*Rear Quarters:* Metal with quarter windows.

*Front Seat:* Stationary—leather trim.

*Extra Seats:* Two extra wide, facing forward, without arms, upholstered with springs—semi-concealed.

*Windshield:* Perpendicular V-front. Swing-out type, frame painted, inner frames chrome. Security-Plate glass.

*Ventilators:* Two on top of cowl, one on each side.

*Lighting:* One dome light combined with ventilator in rear compartment, additional dome light in front compartment, two corner lights, two step lights for rear doors.

*Windows:* All doors drop flush with mouldings. Rear quarter, part way. Security-Plate glass. Window reveals chrome plated.

*Hardware:* Fleetwood design, chrome plated.

*Toilet Cases:* Vanity case with imported 8-day clock, two ash trays, mirror and cigarette case. Smoking case with two ash trays and cigar lighter.

*Foot Cushions:* Spring type, padded, combining foot rest and hassock features.

*Partition:* Division between front and rear compartments with header bar at roof. Glass can be raised or lowered. Division frame chrome plated.

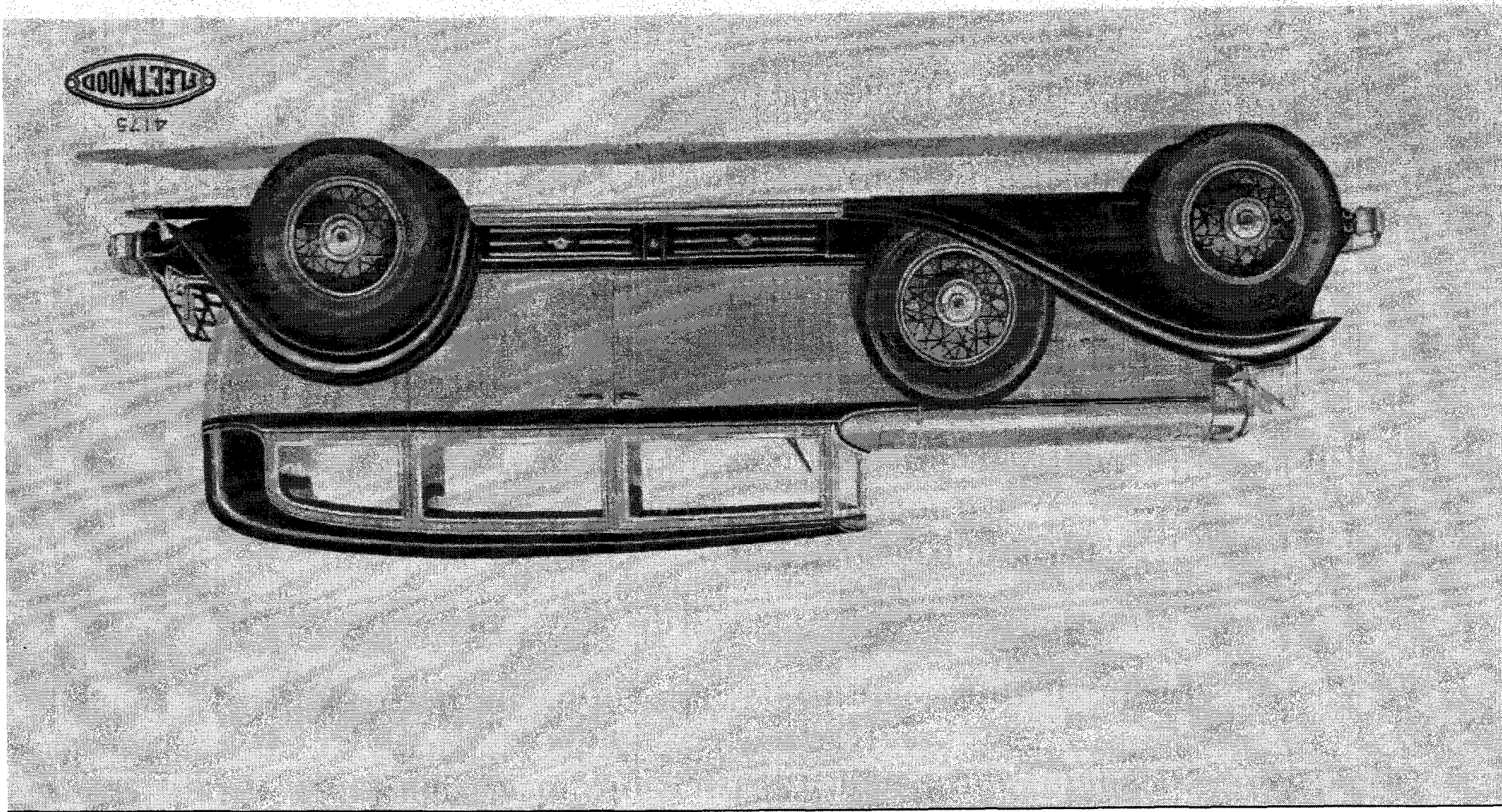
*Side Arm Rests:* Combination side arm rests and concealed pocket. Access is gained to pocket by raising top pad of arm rest.

*Telephone:* Right side of rear seat.

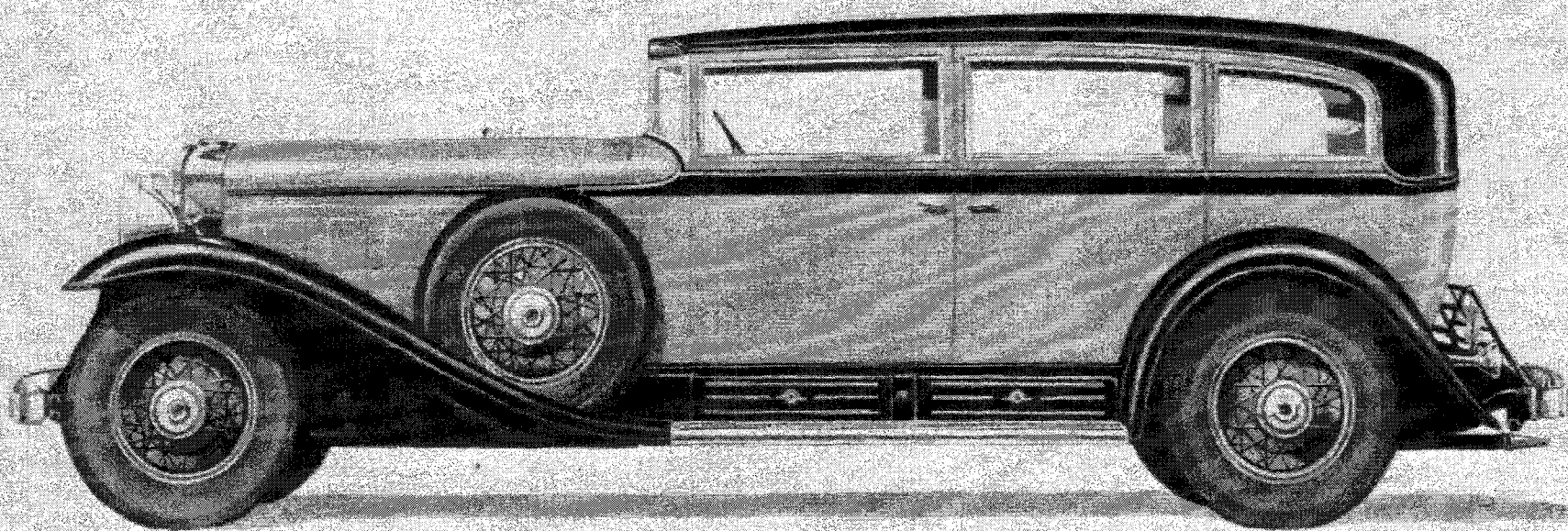
Robe cord with assist cords. Folding arm rest. Side arm rests. Arm slings. Luggage carrier. Sheepskin mat for rear compartment. Silk umbrella. Wired for radio. Silk curtains on quarter windows and rear window. Adjustable rear seat back and rear cushion.

*Note:* Twenty-four (24) of this type available. Balance with straight slanting shield, Fisher VV type.

1930 Cadillac Seven-Passenger Imperial Style No. 4175







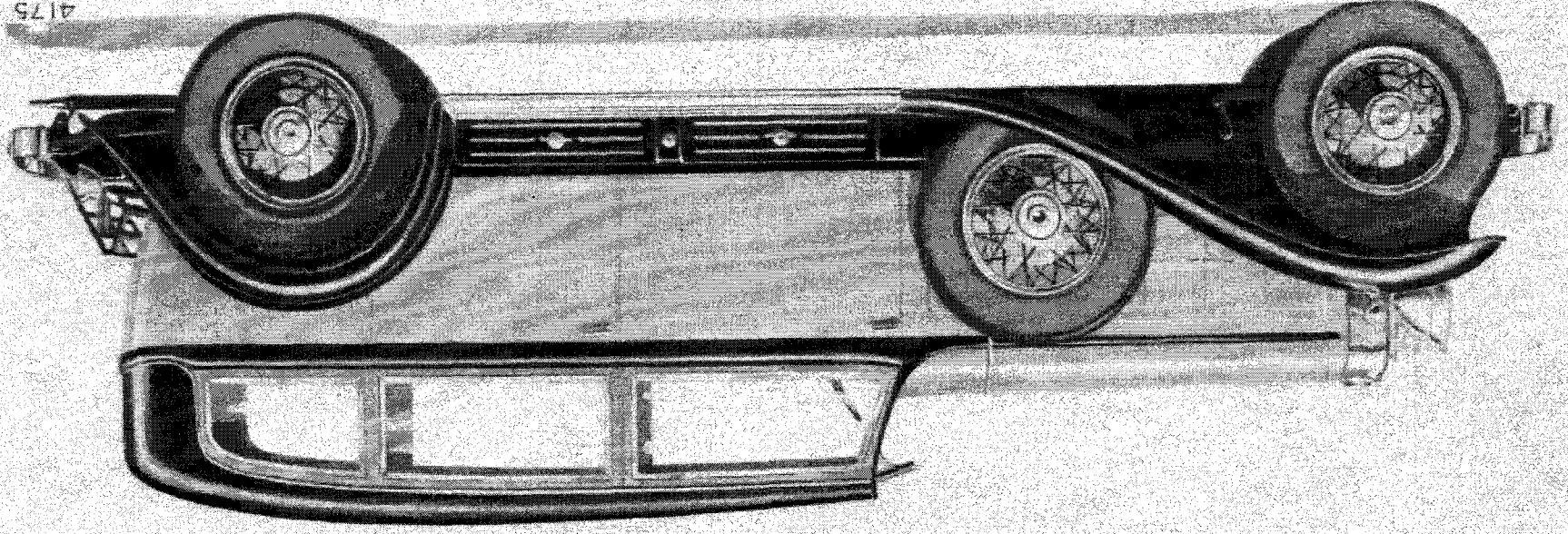
4175 S  
FLEETWOOD

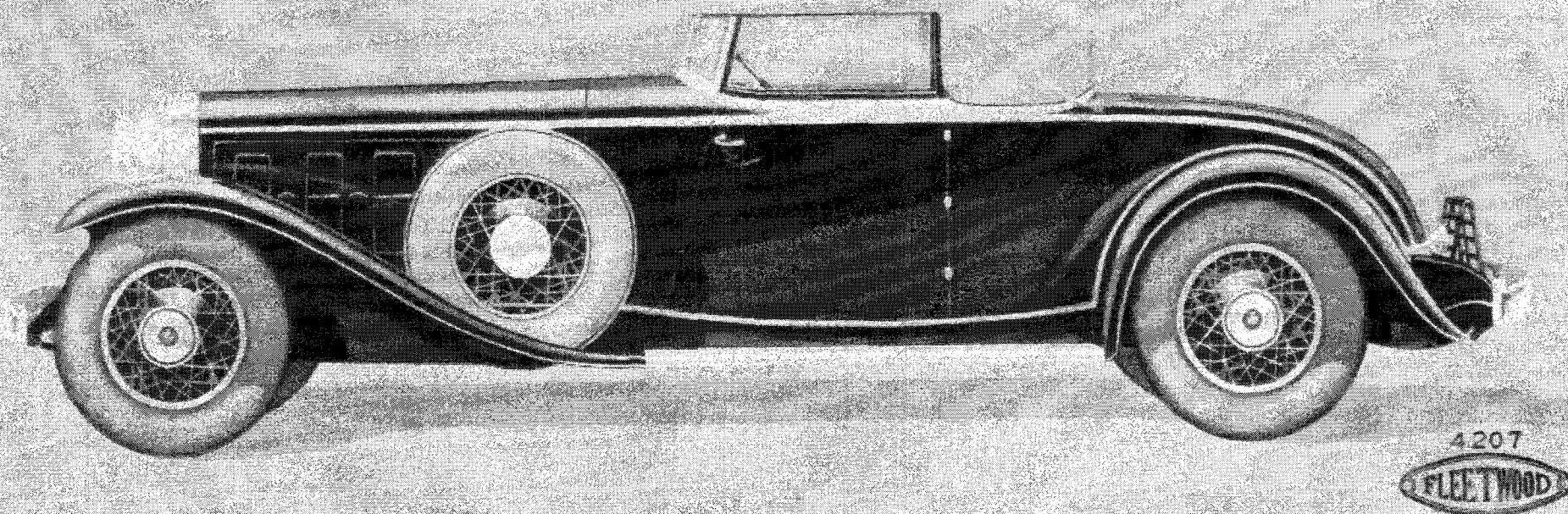
1930 Cadillac Style No. 4175-S



# 1930 Cadillac Style No. 4175 Slanting Windshield

4175  
SLANTING WINDSHIELD  
FLEETWOOD



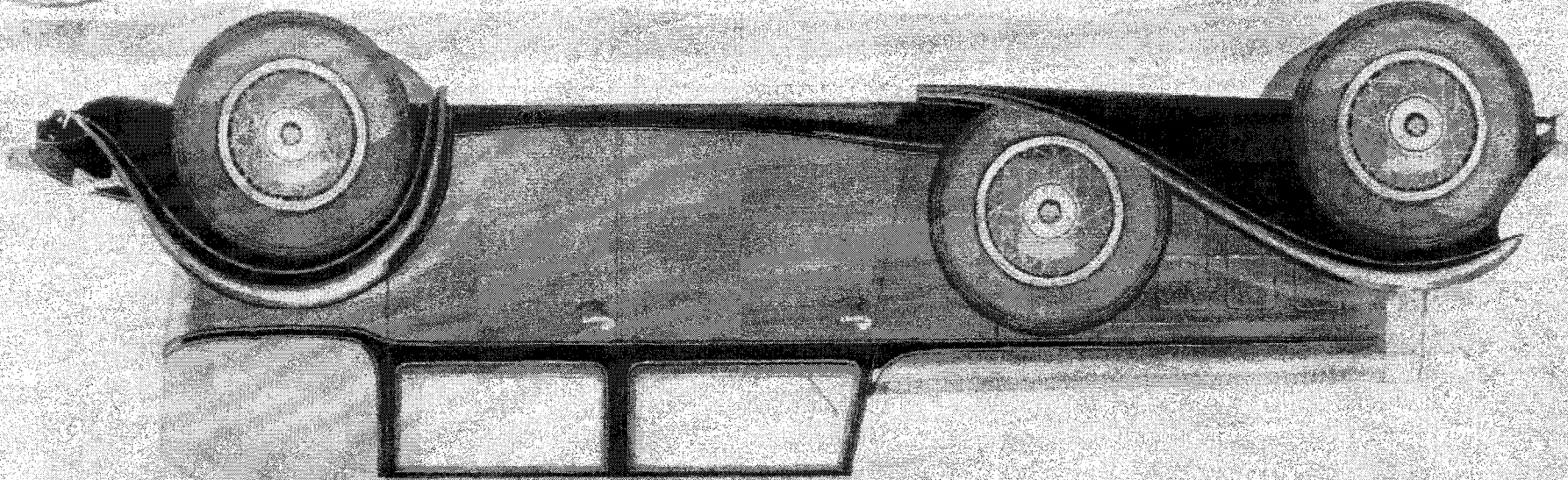


*Special Body by Fleetwood - on order.*

1930 Cadillac Style No. 4207



*Special Body by Fleetwood - on order.*



# Transformable Town Cabriolet

*Style No. 4212*

*Rear Quarters:* Full leather quarters with imitation landau bows. No rear quarter window.

*Extra Seats:* Two opera type seats. Left seat faces side, right faces rear.

*Windshield:* Solid bronze frame. Painted to match body. Straight swing-out type with chrome plated inner frames. Clear vision, non-glare. Security-Plate glass.

*Ventilators:* One top, one each side of cowl.

*Lighting:* One dome light combined with ventilator, two corner lights, two step lights for rear doors.

*Windows:* Front doors, rear doors and division drop flush with mouldings. Security-Plate glass.

*Hardware:* Fleetwood design, chrome plated.

*Interior Finish Panels:* Walnut with burl inlay and ebony inlaid stripe on rear doors and division. Combination finish panel and smoking case across center division.

*Foot Cushions:* Spring type, padded, combining foot rest and hassock features.

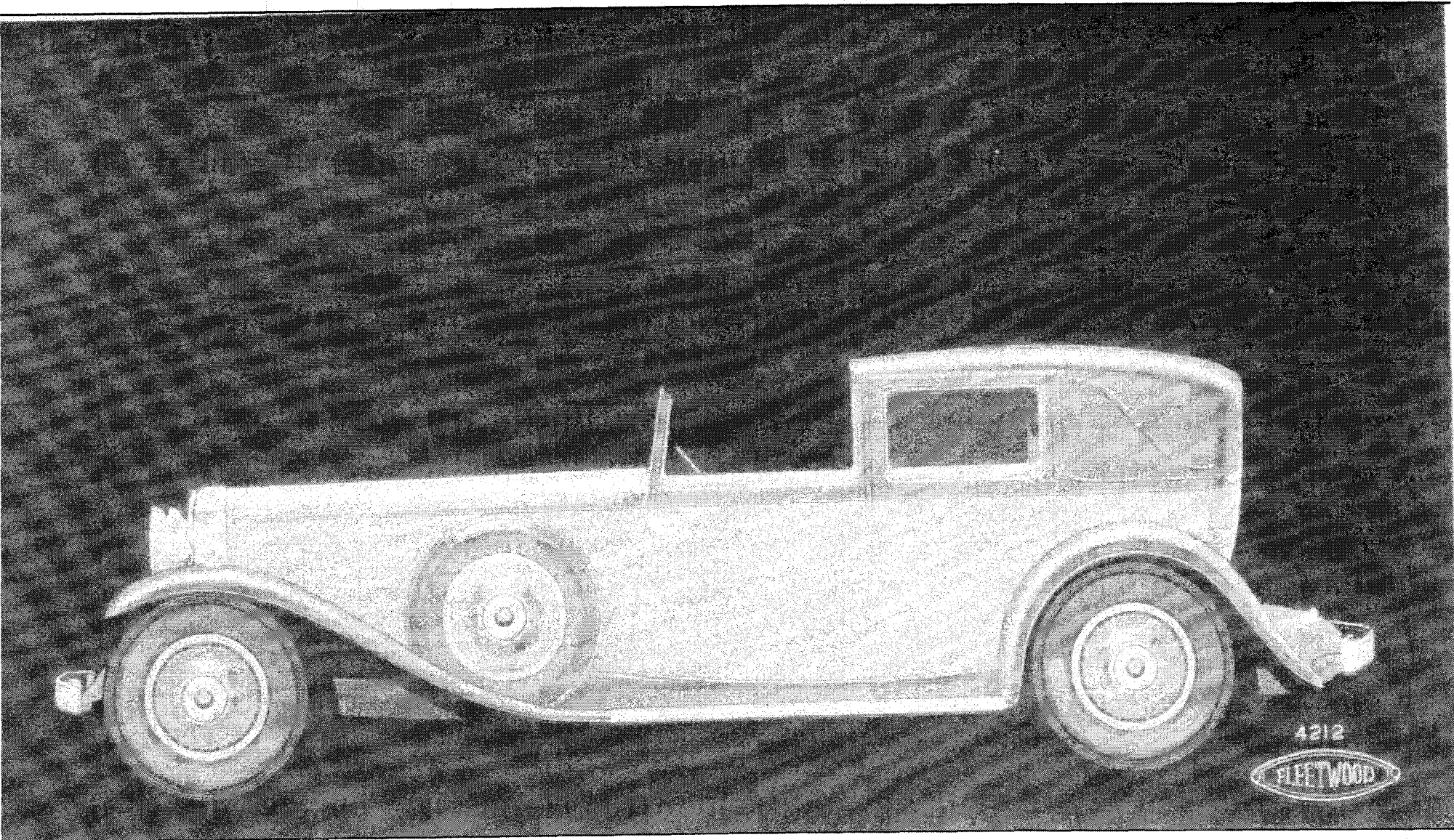
*Side Arm Rests:* Combination side arm rest and concealed pocket. Access is gained to pocket by raising top pad of arm rest.

*Driver's Roof Curtain:* Entire curtain can be folded back and completely concealed in compartment in upper front part of body.

*Telephone:* Right side of rear seat. Also porthole in division glass.

*Silk Curtains:* All windows in rear compartment including center partition.

Robe cord. Folding arm rest. Arm slings. Wired for radio. Adjustable rear seat back and rear cushion. Clock on division header bar.



1930 Cadillac Transformable Town Cabriolet Style No. 4212



# Transformable Town Cabriolet

*Style No. 4220*

*Rear Quarters:* Small quarter windows with leather back and imitation landau bows.

*Extra Seats:* Two extra wide, facing forward without arms, upholstered with springs and semi-concealed.

*Windshield:* Solid bronze frame painted to match body. Straight swing-out type with chrome plated inner frames. Clear vision, non-glare, Security-Plate glass.

*Ventilators:* One top, one each side of cowl.

*Lighting:* One dome light combined with ventilator, two corner lights, two step lights for rear doors.

*Windows:* All doors and division drop flush with mouldings. Rear quarter part way. Security-Plate glass.

*Hardware:* Fleetwood design chrome plated.

*Interior Finish Panels:* Walnut with burl inlay and ebony inlaid stripe on rear door, quarter windows and division. Combination finish panel and smoking case across center division.

*Foot Cushions:* Spring type, padded, combining foot rest and hassock features.

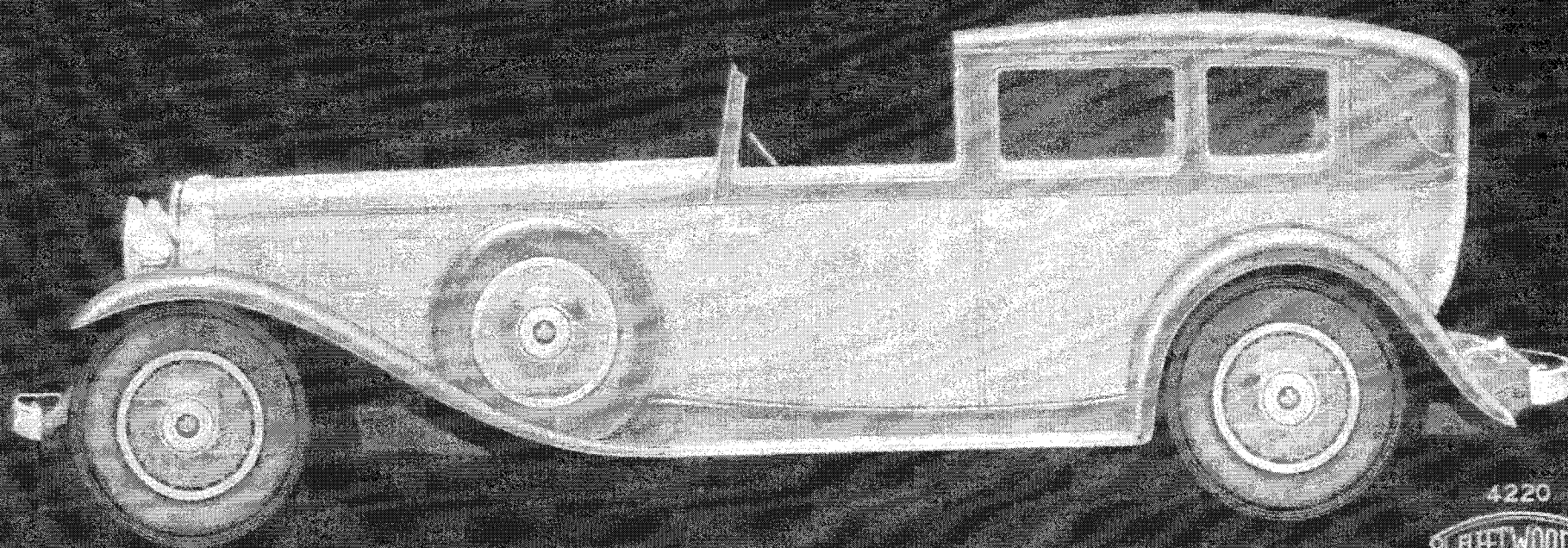
*Side Arm Rests:* Combination side arm rest and concealed pocket. Access is gained to pocket by raising top pad of arm rest.

*Driver's Roof Curtain:* Entire curtain can be folded back and completely concealed in compartment in upper front part of body.

*Telephone:* Right side of rear seat. Also porthole in division glass.

*Silk Curtains:* All windows in rear compartment including center partition.

Robe cord. Folding arm rest. Arm slings. Wired for radio. Adjustable rear seat back and rear cushion. Clock on division header bar.



1930 Cadillac Transformable Town Cabriolet Style No. 4220



# Transformable Town Cabriolet

Style No. 4225

*Rear Quarters:* Full leather quarters with imitation landau bows. No rear quarter windows.

*Extra Seats:* Two extra wide, facing forward without arms, upholstered with springs—semi-concealed.

*Windshield:* Solid bronze frame painted to match body. Straight swing-out type with chrome plated inner frames. Clear vision, non-glare. Security-Plate glass.

*Ventilators:* One top, one each side of cowl.

*Lighting:* One dome light combined with ventilator, two corner lights, two step lights for rear doors.

*Windows:* All doors and division drop flush with mouldings. Security-Plate glass.

*Hardware:* Fleetwood design, chrome plated.

*Interior Finish Panels:* Walnut with burl inlay and ebony inlaid stripe on rear doors and division. Combination finish panel and smoking case across center division.

*Foot Cushions:* Spring type, padded, combining foot rest and hassock features.

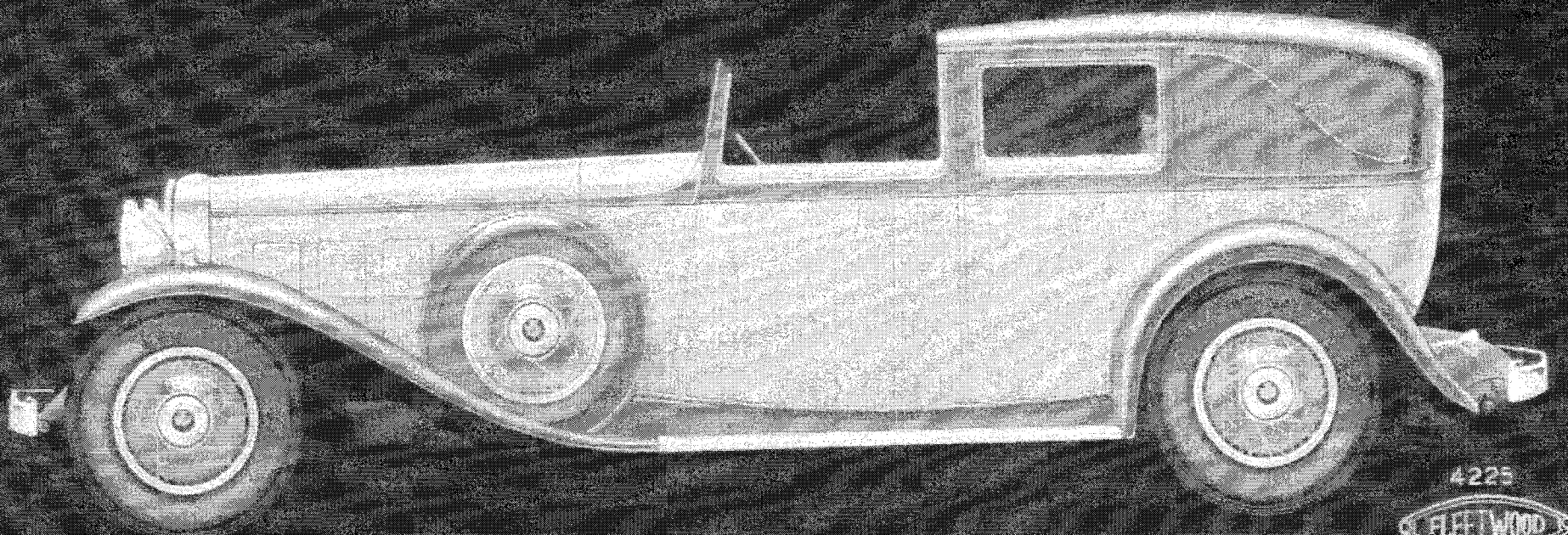
*Side Arm Rests:* Combination side arm rest and concealed pocket. Access is gained to pocket by raising top pad of arm rest.

*Driver's Roof Curtain:* Entire curtain can be folded back and completely concealed in compartment in upper front part of body.

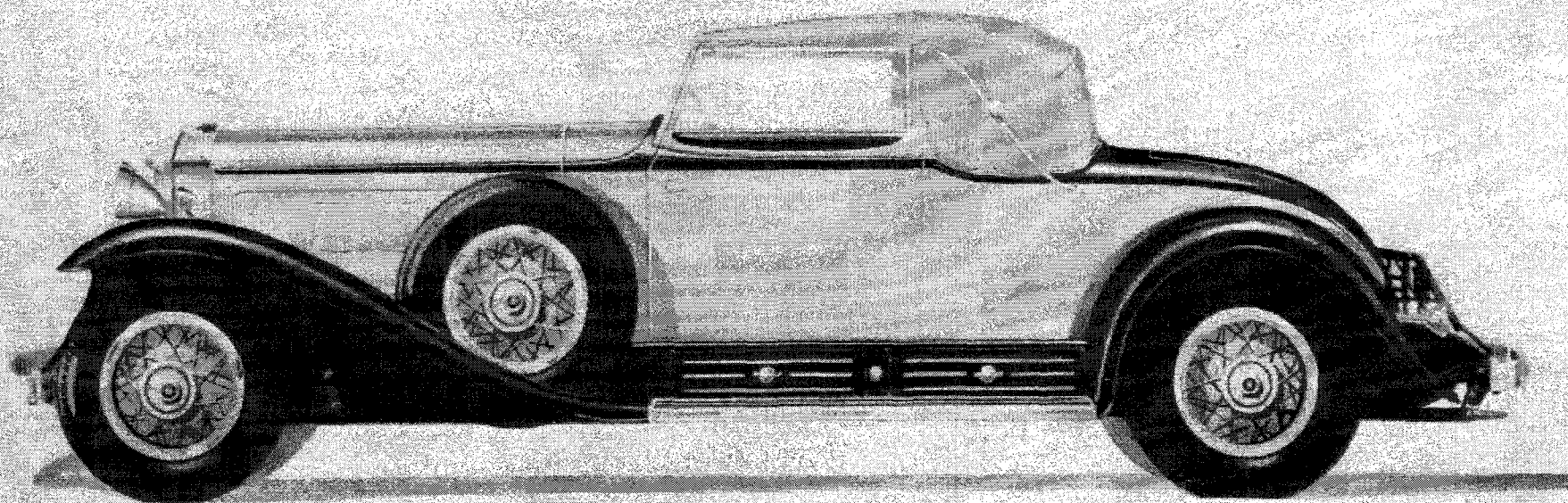
*Telephone:* Right side of rear seat. Also porthole in division glass.

*Silk Curtains:* All windows in rear compartment including center partition.

Robe cord. Folding arm rest. Arm slings. Wired for radio. Adjustable rear seat back and rear cushion. Clock on division header bar.



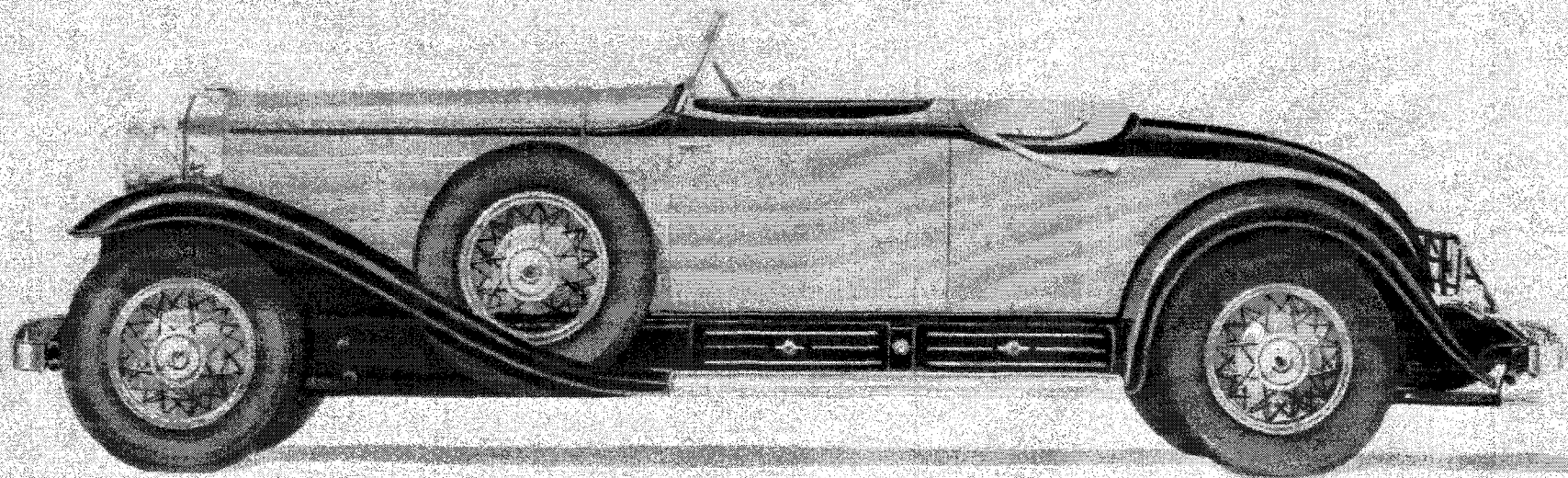
1930 Cadillac Transformable Town Cabriolet Style No. 4225



*Will have "Coach Sill" feature*

1930 Cadillac Style No. 4235





4235



*Will have "Coach Sill" feature.*

1930 Cadillac Style No. 4235

# Town Brougham

*Style No. 4264*

*Rear Quarters:* Metal, square corners, no quarter windows.

*Extra Seats:* Two opera type seats. Left faces side, right faces rear.

*Windshield:* Solid bronze frame, painted to match body. Straight swing-out type with chrome plated inner frames. Clear vision, non-glare, Security-Plate glass.

*Ventilators:* One top, one each side of cowl.

*Lighting:* One dome light combined with ventilator, two corner lights, two step lights for rear doors.

*Windows:* Front doors, rear doors and division drop flush with mouldings. Security-Plate glass.

*Hardware:* Fleetwood design, chrome plated.

*Interior Finish Panels:* Front and rear doors. Division panel is combination panel and smoking case.

*Side Arm Rests:* Combination side arm rest and concealed pocket. Access is gained to pocket by raising top pad of arm rest.

*Driver's Roof Curtain:* Entire curtain can be folded back together with side panels into compartment and completely conceals in upper front part of body.

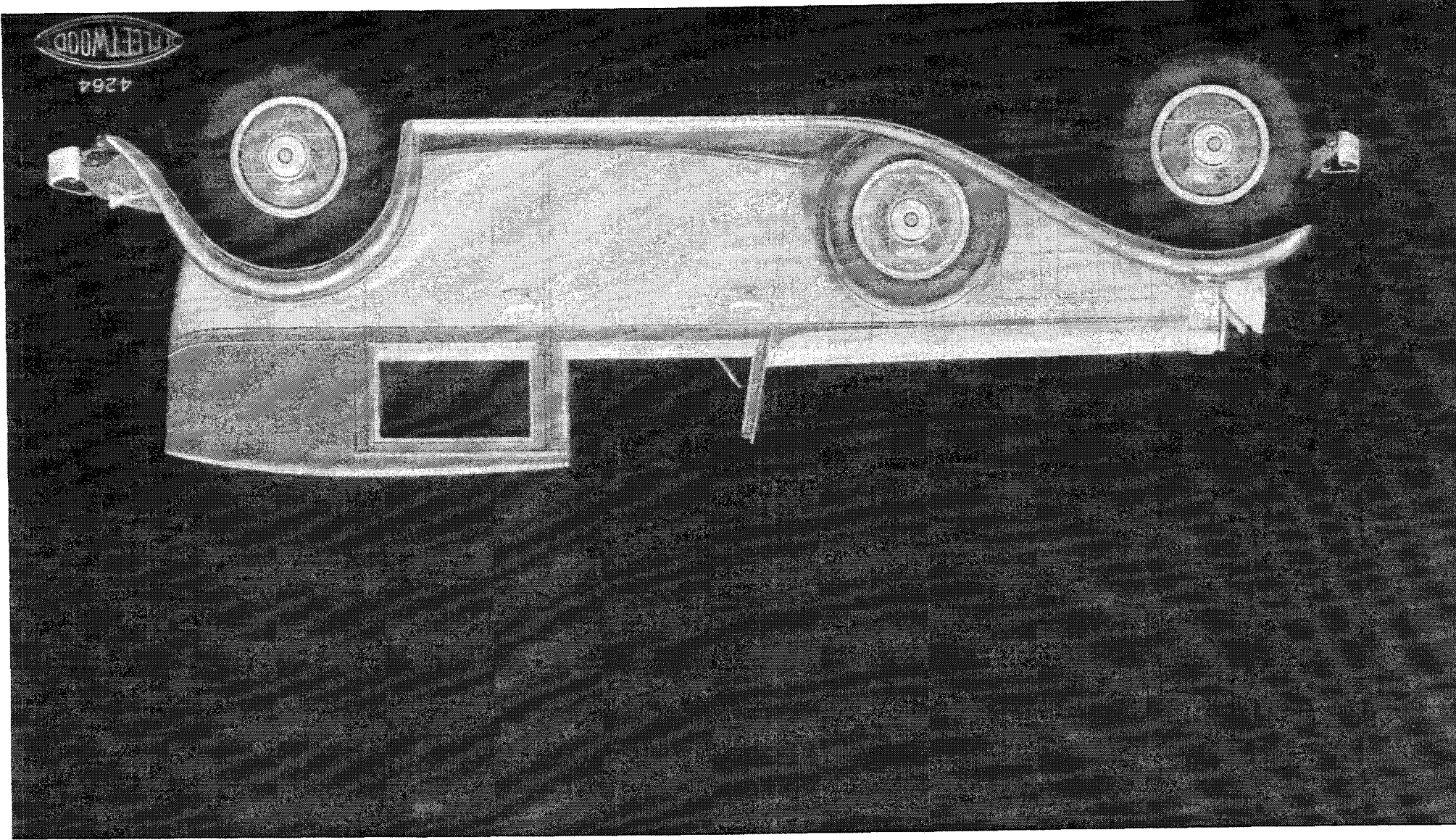
*Telephone:* Right side of rear seat. Also porthole in division glass.

*Silk Curtains:* All windows in rear compartment including center division.

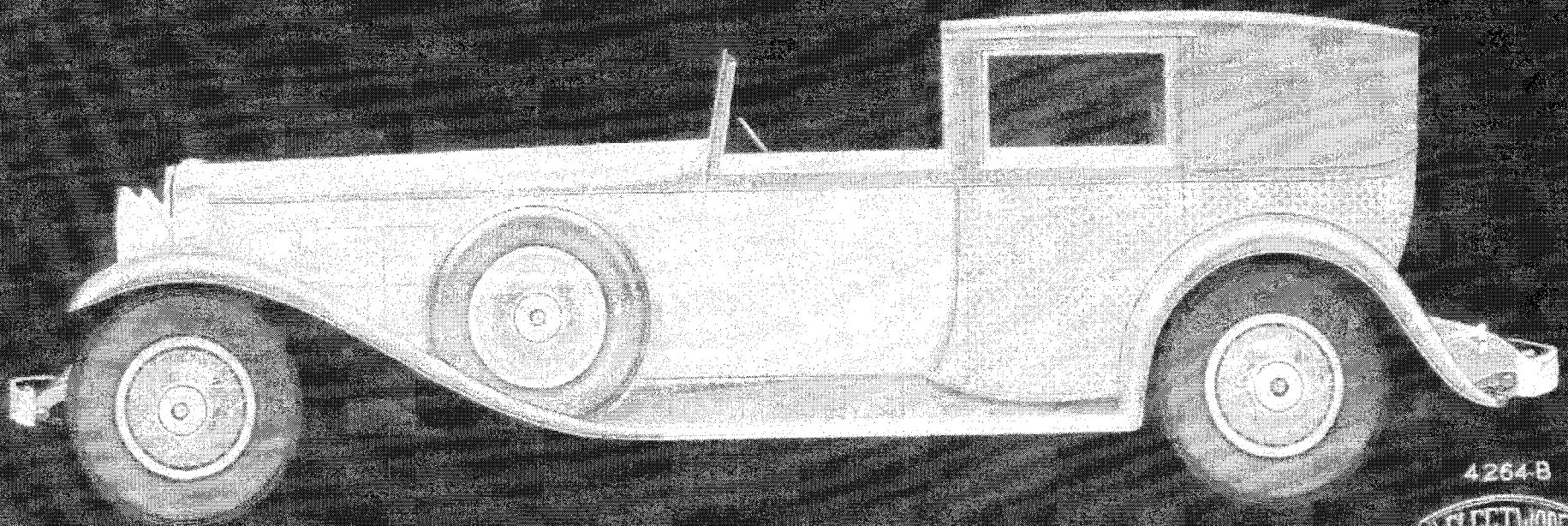
Folding arm rest center of rear seat. Wired for radio. Two arm slings. Side arm rests. Small slash pocket right side of rear compartment for mirror. Clock on division header bar. Adjustable rear seat and rear cushion.

Note: Style 4264-B has same appointments as above.

1930 Cadillac Town Brougham Style No. 4264







4264-B  
FLEETWOOD

1930 Cadillac Town Brougham Style No. 4264-B

# All-Weather Phaeton

*Style No. 4280*

*Rear Quarters:* Burbank top and rear quarters.

*Partition:* Glass division between driving and rear compartments which may be raised or lowered and also utilized as a tonneau shield when top is lowered. Center pillars are collapsible.

*Front Seat:* Stationary.

*Windshield:* Straight swing-out type. Full chrome.

*Ventilators:* Two on top of cowl, one on each side of cowl.

*Lighting:* Two step lights for rear doors.

*Windows:* All drop flush with mouldings. Security-Plate glass.

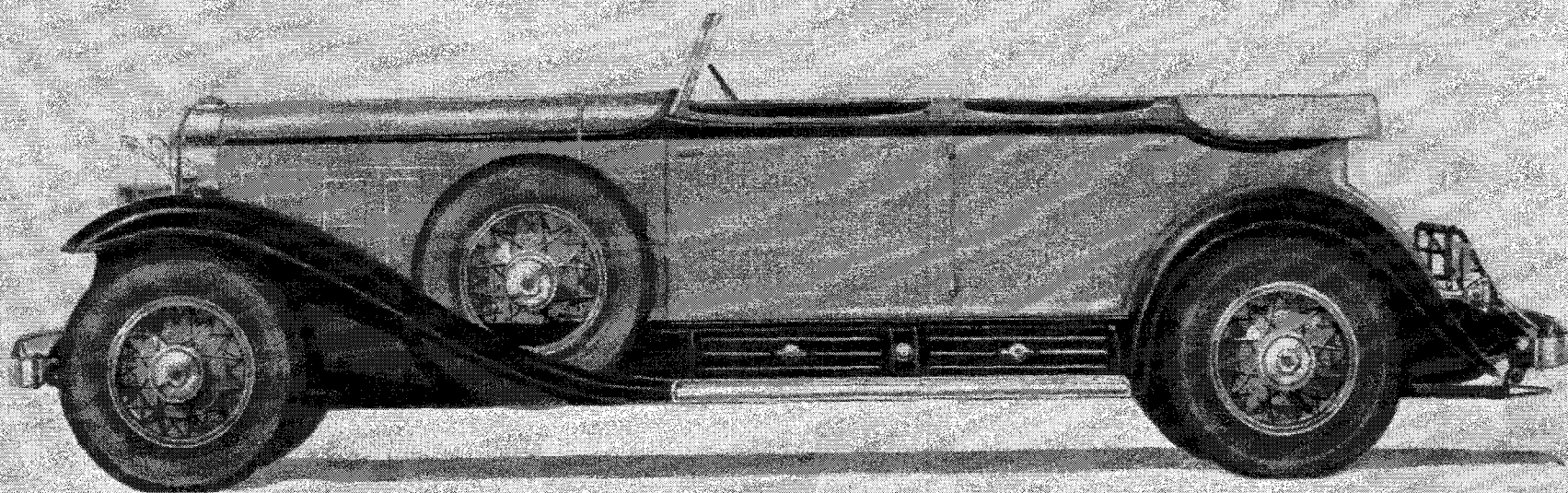
*Hardware:* Fleetwood design, chrome plated.

*Ash Receivers:* Flush type in all doors.

*Foot Cushions:* Spring type, padded, combining foot rest and hassock features.

*Folding Arm Rest:* Front and rear seats.

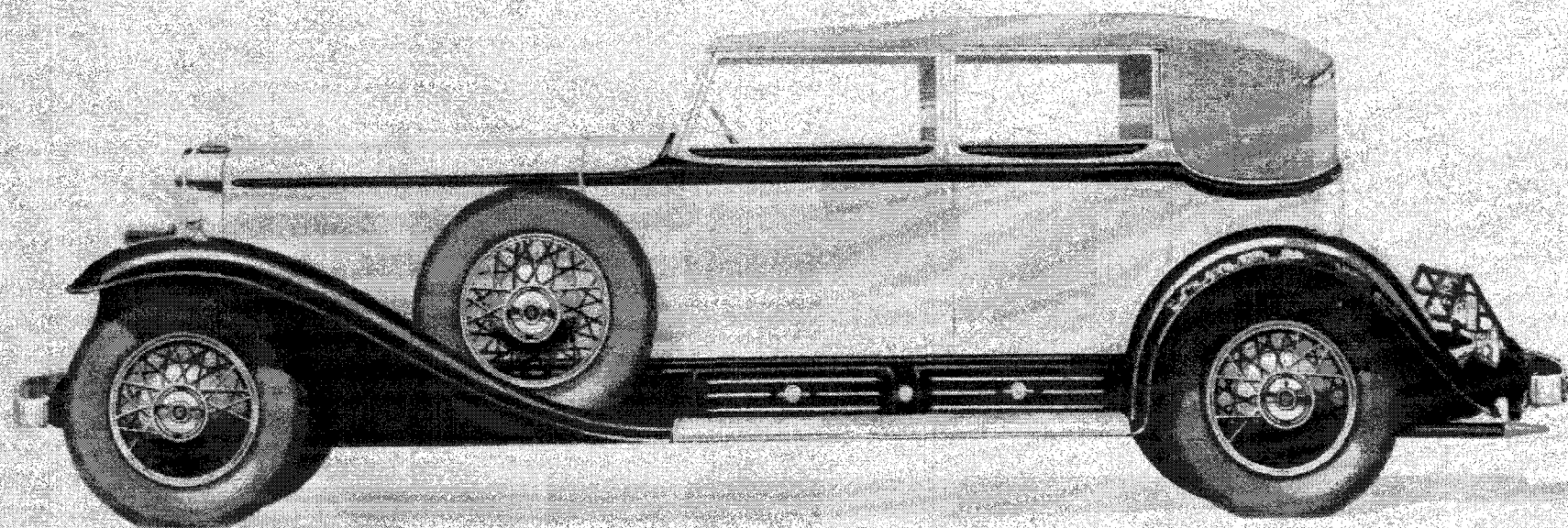
Robe Cord. Envelope for top when folded. Wired for radio.



*Will have "Coach Sill" feature.*

1930 Cadillac All-Weather Phaeton Style No. 4280





4280  
FLEETWOOD

*Will have "Coach Sill" feature.*

1930 Cadillac All-Weather Phaeton Style No. 4280

# Transformable Limousine Brougham

Style No. 4291

*Rear Quarters:* Metal with quarter windows.

*Extra Seats:* Two extra wide, facing forward without arms, upholstered with springs—semi-concealed.

*Windshield:* Solid bronze frame painted to match body. Straight swing-out type with chrome plated inner frames. Clear vision, non-glare, Security-Plate glass.

*Ventilators:* One top, one each side of cowl.

*Lighting:* One dome light combined with ventilator, two corner lights, two step lights for rear doors.

*Windows:* All doors and division drop flush with mouldings. Rear quarter part way. Security-Plate glass.

*Hardware:* Fleetwood design, chrome plated.

*Interior Finish Panels:* Walnut with burl inlay and ebony inlaid stripe on rear doors, quarter windows and division. Combination finish panel and smoking case across center division.

*Foot Cushions:* Spring type, padded, combining foot rest and hassock features.

*Side Arm Rests:* Combination side arm rest and concealed pocket. Access is gained to pocket by raising top pad of arm rest.

*Driver's Roof Curtain:* Entire curtain can be folded back and completely concealed in compartment in upper front part of body.

*Telephone:* Right side of rear seat. Also porthole in division glass.

*Silk Curtains:* All windows in rear compartment including center partition.

Robe cord. Folding arm rest. Arm slings. Wired for radio. Adjustable rear seat back and rear cushion. Clock on division header bar.