



**HOW
TO CHOOSE
a
MOTOR CAR
WISELY**




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BUICK MOTOR COMPANY



THIS BOOKLET sets forth in simple, everyday language a few of the most important mechanical principles of motor car construction.

Its purpose is to give the average purchaser a clear, non-technical description of the main mechanical features of a motor car. It presents the principles of construction which have been selected as best by leading authorities, and it gives definite reasons for those selections.

It was prepared by the Engineering Department of the Buick Motor Company to assist you in making a sound and impartial decision when the time comes for you to select your next motor car.

The principles discussed are fundamental and time-proven. They will apply fully to any automobile you may have under consideration, now or in the future.

Keep this booklet as a reference guide to help you choose your motor car wisely.

Knowledge of ten important principles of motor car design will prove an invaluable aid to you in choosing your motor car wisely.

This booklet will tell you what these principles are, the theories behind them, the reasons for their superiority and how you, yourself, can see whether they have been incorporated in the design of the automobile you are considering.

The facts and technical theories discussed in these pages have been furnished by the engineering department of the Buick Motor Company.

They do not advance the opinions of any one man, but rather the combined experience of a group of engineers known throughout the automobile industry for its ability and accomplishments.

These men are devoting their lives to research, test and experiment in a sincere effort to improve present-day standards of motoring. And the work they have done in the past quarter-century has undoubtedly contributed much to the development of the automobile during that period.

Although they constantly seek to improve and refine, they never for a moment lose sight of the fact that the great purpose of any automobile is to provide transportation—comfortable,



pleasant, *reliable* transportation. Reliability is their first consideration in seeking to improve engine, chassis or body design.

Reliability has been their first consideration in selecting and discussing the ten principles that make up this booklet.

And reliability should be your first consideration in choosing your motor car. For unless your car starts when you want it to, and takes you where you want to go, *on time*, day after day and year after year, you are not receiving the fullest measure of satisfactory transportation.

Unfortunately, reliability—the first requisite of a fine automobile—is far more difficult to make sure of before purchasing than performance, beauty or comfort. Those you can judge for yourself by demonstration. But the only demonstration of reliability comes from actual ownership.

And you may be sure that any group of engineers capable of producing absolute reliability in an automobile can also be depended upon to build into that car brilliant performance, great economy and a high degree of beauty and comfort.

This booklet will help you to select a reliable automobile. Study the ten fundamental principles of sound automobile design. And take them with you when you examine any car—regardless of make or price.



Point Number One

Principles of Engine Design

❖

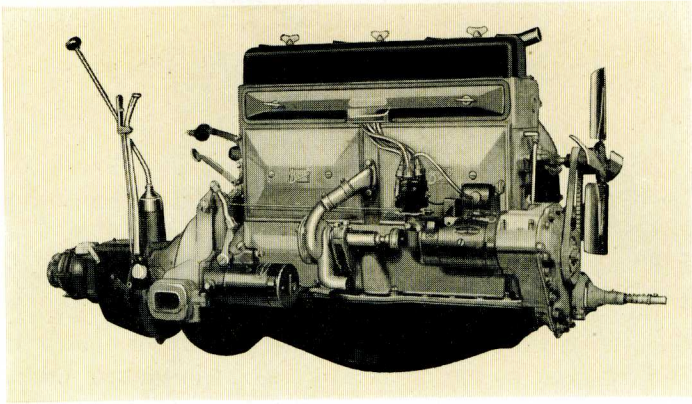
Of all the types of internal combustion engines in use today, the valve-in-head engine is considered the best because of its superior efficiency, economy and power.

Racing cars are rarely, if ever, powered by any other type of engine—because valve-in-head engines develop more power per cubic inch of piston displacement than any other kind; because the excessive strains of tremendous speeds require the utmost in reliability, and because quick repairs necessitate the greatest accessibility of working parts. Every racing car on the track at the last great Indianapolis Speedway Classic was valve-in-head equipped.

The fact that the majority of airplanes built today are equipped with valve-in-head engines also testifies to the superiority of this type of motor. Great power, light weight, exceptional fuel economy, and the highest degree of dependability are vitally important in airplane engines. The engines used by Lindbergh, Chamberlin, Maitland, Byrd and other trans-oceanic flyers possessed these qualities—and were of the valve-in-head type.

And the greater efficiency of the valve-in-head engine brings still another advantage to the average motorist—utmost economy of operation.

Of course, valve-in-head engines are more expensive to build than other types, but this greater original cost is more than compensated by their greater fuel economy, length of life and freedom from attention.



The Buick Valve-in-Head Six Cylinder Engine

Buick, for twenty-four years, has used only engines of valve-in-head design.

In the case of Buick, the greater cost of building the valve-in-head type of engine is more than offset by the savings of Buick's tremendous volume production—savings that Buick policy dictates shall be passed on to buyers of Buick cars.

In 1903 the first Buicks ever built were powered by valve-in-head engines. And every one of the two million Buicks turned out since that time has been so equipped.

Scores of improvements and refinements have been developed by Buick engineers during the last quarter century—and incorporated as an integral part of the engine design.

Today the Buick six-cylinder valve-in-head engine is famous the world over for efficiency, economy and dependability.

Point Number Two

Principles of Crankshaft Design



One of the great problems in the improvement of automotive engine design has been the elimination of vibration. For smoothness of operation adds tremendously to the enjoyment of driving, as well as providing longer life to the entire car.

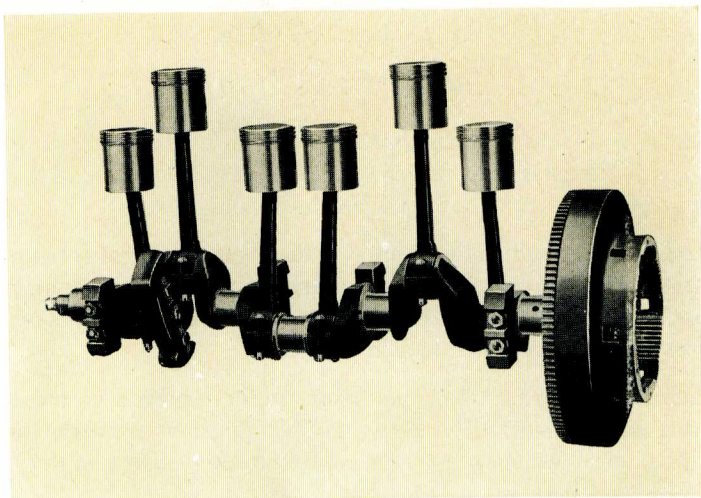
Engineers discovered years ago that the major source of vibration was in the crankshaft and reciprocating parts. And experiments of every conceivable variety were begun in an effort to achieve greater smoothness.

Two causes of vibration had to be eliminated—first, the vibration caused by centrifugal force in a rapidly revolving, irregularly shaped bar of steel—and second, the vibration caused by the reciprocating action of the pistons which are connected in different places along the crankshaft.

Research brought out the fact that a heavier crankshaft would, in a measure, make engine operation smoother. But this added weight did not eliminate vibration.

Extra bearings were used in an attempt to solve the problem. They tied the crankshaft down so that vibration was less noticeable at certain speeds but they increased friction, and vibration still existed.

Finally, after years of experiment, engineers discovered that perfect balancing counterweights would eliminate centrifugal vibration and crankshaft whip. And later the torsion balancer was developed to eliminate torsional vibration.



The Buick Counter-balanced Crankshaft

Buick uses the counter-balanced crankshaft, with the torsion balancer. And it has proven so effective that today the Buick valve-in-head engine is known the world over as "the engine vibrationless beyond belief."

Since only four bearings are required in this type of crankshaft, the bearings may be larger—permitting better lubrication—and resulting in longer bearing life.

Counter-balanced crankshafts require more precise workmanship than other types and consequently, cost more to build. In this case, as in all others, Buick uses only the best, regardless of cost.

Point Number Three

Engine Protection

No matter how well designed an engine may be, nor how carefully assembled—no matter how high the quality of the material used, nor how precise the machine work—

Unless that engine is protected from the entrance of foreign matter such as dirt, dust and water, and unless it is properly and adequately lubricated, it will not give the most efficient service nor maximum length of life.

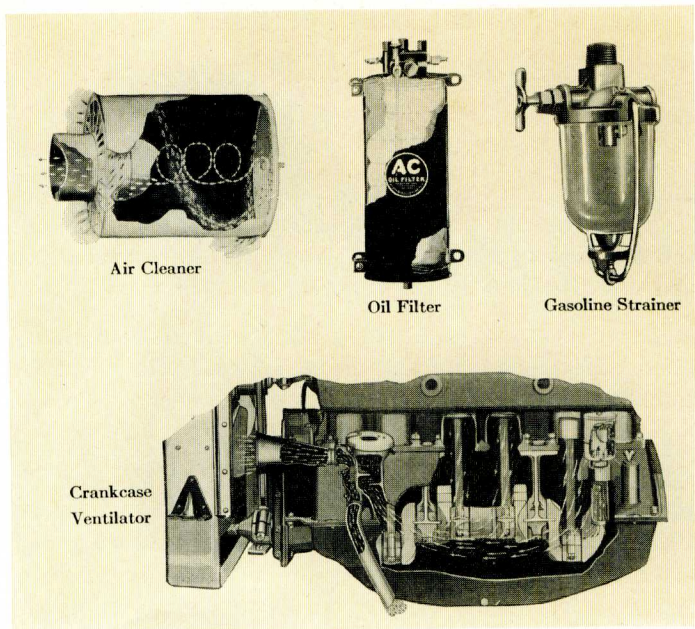
Engineers seeking to provide this protection have devised four methods of sealing automobile engines against the entrance of foreign matter. All four are necessary to provide the fullest measure of protection.

First, the Oil Filter removes dirt, dust and other harmful foreign matter from the engine oil. It keeps the oil clean by continuous filtration, thus preventing premature wear of engine parts, and helps to eliminate the necessity of frequent oil changes.

Second, the Air Cleaner takes the dust out of the air which passes through the carburetor, thus contributing to the long life of pistons, cylinders, engine bearings and carburetor parts.

Third, the Gasoline Strainer, as its name implies, removes water and sediment from the fuel before it reaches the carburetor.

Fourth, the Crankcase Ventilator. This device ejects the harmful vapors from the crankcase. It prevents the condensation of water vapor and oil dilution. The Crankcase Ventilator provides operating economy by making frequent oil changes unnecessary.



The Buick Engine Is Completely Sealed

Almost all cars today have some of these devices to protect their engines.

Buick employs all four—Oil Filter, Air Cleaner, Gasoline Strainer and Crankcase Ventilator. Buick leaves nothing to chance—omits no feature that will help to achieve absolute reliability.

And in the case of Buick, these devices have been carefully designed to function as integral parts of the engine, not merely added as extra equipment.

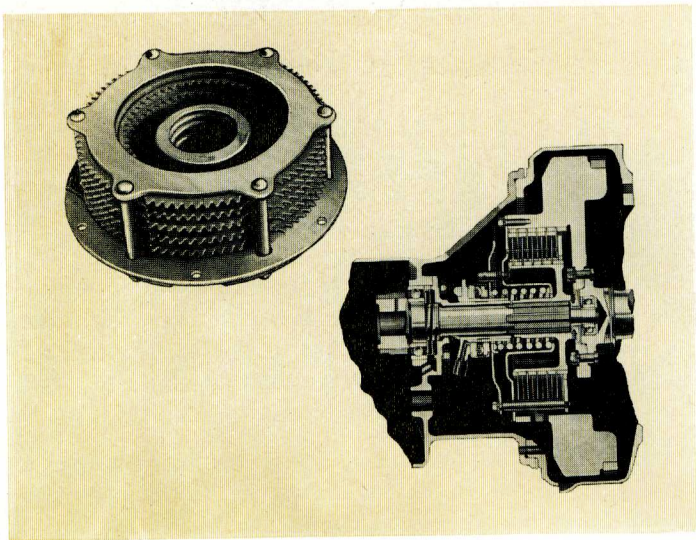
Point Number Four

Function of the Clutch

Since the primary function of the clutch is to engage or disengage the motor from the drive shaft at the driver's will, it is one of the most important points to check in a car's construction before purchasing.

Things to look for particularly are positiveness of clutch action, ease of operation and the smoothness with which the motor is engaged.

The multiple dry disc type of clutch is generally conceded to be the most efficient and will be found on many really fine cars. It is more expensive to manufacture than some other types, but more than offsets this extra cost by giving better service.



❧ The Buick Multiple Disc Clutch ❧

Buick uses the multiple dry disc type of clutch.

Precision engineering and careful workmanship make the Buick clutch exceptionally easy in action—so easy, in fact, that even a child can operate it. This is one reason why more women drive Buicks than any other fine car.

Then, too, Buick owners never know the annoyance of clutch jerking. And they are assured of absolute dependability.

And finally, the Buick multiple disc clutch is so simple and its adjustment so accessible that adjustment can be made by anyone, by merely turning a thumb nut.

Point Number Five

How the Engine Drives the Car

The power from the engine, after it passes through the transmission, goes to the rear axle, and then to the rear wheels.

As the wheels begin to turn, they push the car forward—either through the rear springs, to the rear part of the frame—or through a Torque-Tube to the front of the frame. Although the Torque-Tube drive is more expensive to build, it has a number of important advantages.

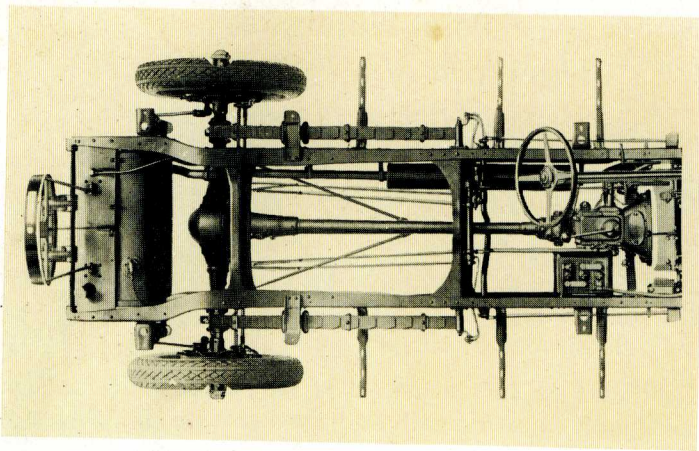
It absorbs the twisting strains of the rear axle and keeps the rear wheels and axle in perfect alignment. This is an invaluable aid both to steering and roadability.

It completely encloses the entire driving mechanism, keeping out dirt, retaining the lubricant and preventing wear.

It permits the use of only one universal joint instead of two, and that one is automatically lubricated.

It insures uniform brake action regardless of load or road conditions.

It relieves the rear springs of the necessity of helping to drive the car.



Rear wheels are kept in perfect alignment with front wheels and frame, assuring easy steering and positive control under all driving conditions.

❧ The Buick Torque-Tube Drive ❧

In line with Buick's policy to always do things the best way, regardless of cost, Buick uses the Torque-Tube drive principle.

And Buick, with its long experience and engineering genius, has perfected this principle to the highest degree of efficiency.

It must be remembered that Buick has refined its Torque-Tube drive along with its cantilever springs and valve-in-head engine over a long period of years.

Point Number Six

The Work of the Springs and Shock Absorbers

The primary function of the springs of any car is to cushion the load, and by doing so, to make riding as easy and comfortable as possible over all types of roads.

However, in cars which do not use the Torque-Tube drive, the springs must serve a dual purpose. They must not only absorb road shocks, but must also help drive the car.

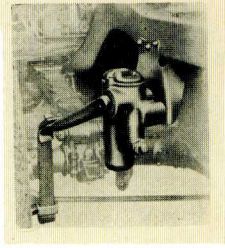
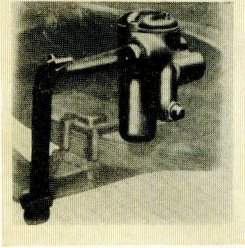
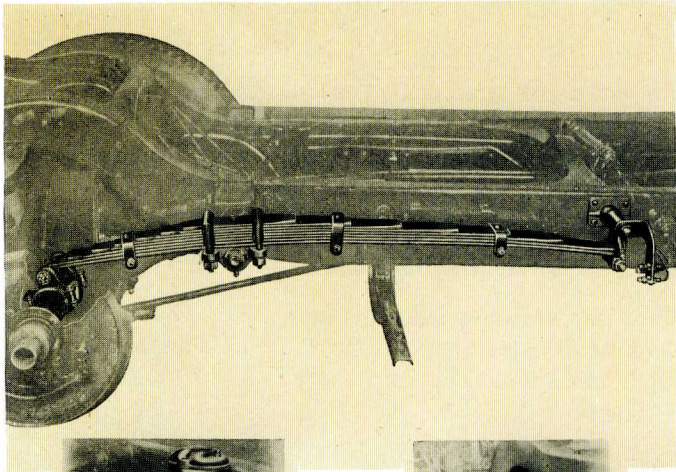
Cantilever springs, because they are permitted to function solely as springs, naturally provide a much higher degree of riding comfort.

They work on an entirely different principle from other types of springs—and have been termed, on good authority, “the world’s easiest riding type.”

Cantilever springs absorb ordinary road shocks through the long, flexible front portion. They absorb the heavier shocks of rough roads through the short, stiff section at the rear. Thus they are designed to overcome any kind of rut, bump or hole which may be encountered.

The short rear section also prevents side sway and reacts from road shocks to keep the rear wheels in contact with the road. This makes braking and steering more positive and gives the driver better control on rough roads.

Shock absorbers of various types have been developed to add to easy riding by counteracting the rebound of the springs. Of the various types in existence today, those which use the hydraulic principle are considered the most effective—both because of their greater efficiency and because they do not require frequent adjustment in order to be effective.



Buick's Cantilever Springs and Buick's Lovejoy Hydraulic Shock Absorbers

Buick has used Cantilever springs on two million cars.

When hydraulic shock absorbers were perfected, Buick adopted them. But they were not merely added to the car as extra equipment.

Buick realized that the way to attain greatest efficiency, and consequently greatest riding ease, was to make springs and shock absorbers function as a single unit. So Buick re-designed its cantilever springs and built in Lovejoy hydraulic shock absorbers as an integral part of the car.

Point Number Seven

The Principles of Frame Construction

The frame of a motor car may well be likened to the foundation of a house.

Just as no building is stronger than its foundation, so is no motor car better than its frame.

The steel used should be of fine quality. The frame should be carefully designed. It must be of adequate size and weight and should be scientifically braced by means of cross-members.

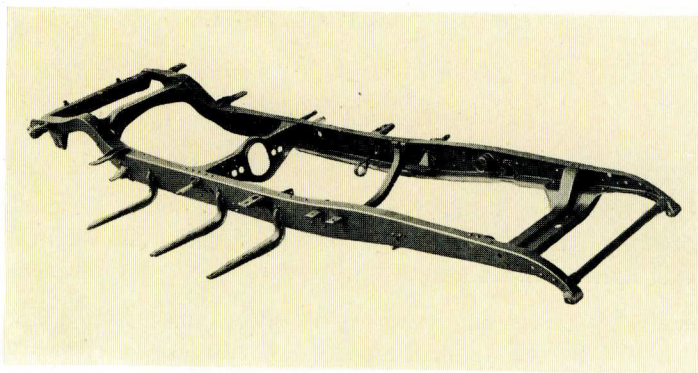
Since the frame must support the body, there are other points to consider besides strength and rigidity.

Its design will definitely affect the car's appearance.

Modern cars should be low-sung—not merely to add to beauty—but also to provide greater safety and greater road-ability.

This effect may be secured by the use of smaller wheels. But this method results in increased tire wear and in loss of road-clearance.

The same low-sung effect may be achieved without these disadvantages by means of the double-drop frame. Of course, the cost of building this type of frame is necessarily greater than the ordinary variety. But it is the best way to do the job.



The double-drop frame assures low-swung bodies, without sacrifice of road clearance or head room.

❧ The Buick Double-drop Frame ❧

Buick uses the Buick double-drop frame which makes possible a low-swung body without loss of head-room or road-clearance and without resort to smaller wheels.

The rugged, sturdy construction of the Buick frame contributes greatly to the famous long-life and dependability of Buick cars. Only highest quality materials are used. Workmanship and design are unsurpassed.

Point Number Eight

The Development of Brakes



Years ago, when traffic was not congested and when poor roads made high touring speeds both dangerous and impractical, brakes on the two rear wheels were deemed sufficient.

However, present day motoring conditions make four-wheel brakes a necessity. And indeed, few cars are built today without them.

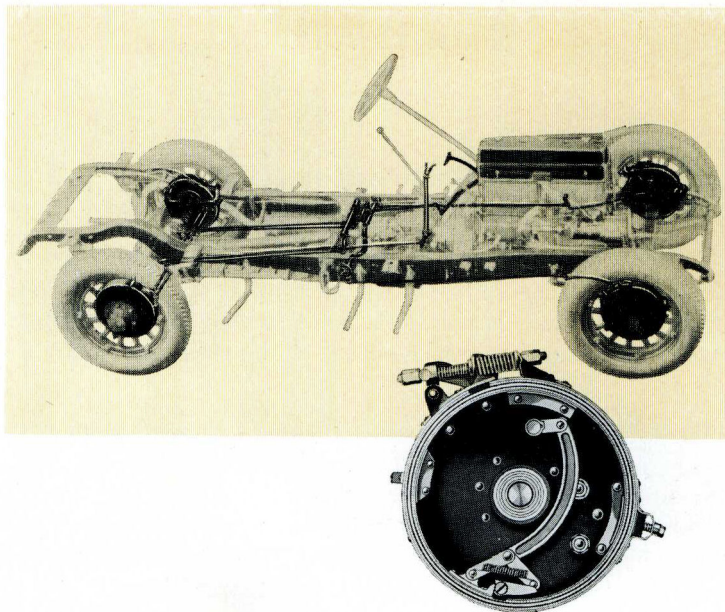
But there are many types of four-wheel brakes, and the selection of the best type is surely of vital importance in choosing your motor car.

Good brakes give you a wonderful sense of security when driving. If you have them you know that you can stop, and stop quickly when necessity arises.

Leading authorities favor the mechanical type of four-wheel brakes.

And among mechanical four-wheel braking systems, those using the external contracting type are given the preference, particularly for use in mountainous districts where brakes may easily become extremely hot from constant use. External contracting brakes lose none of their effectiveness through expansion caused by heat.





Buick Mechanical Four-wheel Brakes

Buick was the first American manufacturer to adopt mechanical four-wheel brakes of the external contracting type. Exhaustive tests convinced Buick engineers of their reliability and satisfaction under all conditions.

There are nearly a million Buicks in operation today with Buick mechanical four-wheel brakes.

And the brakes Buick uses have one very important feature. Applying them while turning a corner does not lock both front wheels. The outside wheel is free to roll, allowing the car to be steered and kept under perfect control.

Point Number Nine

Chassis Protection



When you choose your car you should look especially for factors that contribute to dependability and long life.

The perfect peace of mind that comes from the knowledge that your car is always ready to go—and that it will keep on going as long as you want it to, even though the end of your road lies around the world—is one of the greatest sources of motoring enjoyment.

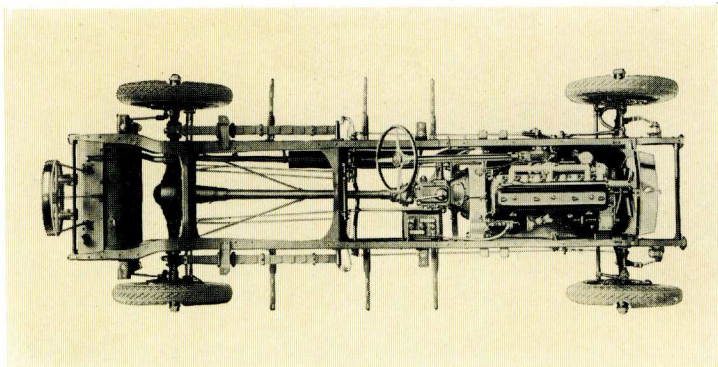
The fact that your car is built to endure for years means not only that you can continue to drive it as long as you like, but actually that you are getting greater value from the money you have invested. For naturally, the more years of service a car has in it, the more it is worth to its owner, both in day by day motoring satisfaction and in trade-in value.

For these reasons it is important that the operating parts in the car you buy be protected from wear as fully as possible.

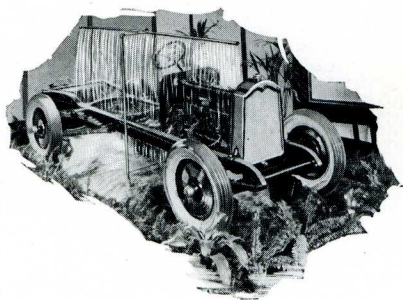
If water is able to reach a vital part of a car during a severe rainstorm and cause a short circuit or otherwise affect its operation, that car lacks dependability—just when dependability is needed most.

And in like manner, if dirt and dust can reach the operating parts of a car they will probably cause friction and consequent wear, thus shortening the life of the car.





The Buick engine and chassis will continue to operate perfectly beneath a constant shower of water for an indefinite period.



❧ The Buick Sealed Chassis ❧

Buick took these facts into consideration when it designed its famous sealed chassis.

Every Buick operating part is enclosed in a dirt-proof, dust-proof, water-tight housing that protects these vital parts from wear. The propeller shaft, for example, which is exposed to the elements in many other cars, is protected in Buicks. This same protection extends to every point in the Buick chassis.

And rainstorms don't stop Buicks. For water does not affect Buick's electrical system. Even the spark plugs are protected.

Point Number Ten

Body Construction



The whole story of a motor car body does not lie in its appearance.

Sound, sturdy construction is as important in building the body of a car as it is in building the chassis.

For unless the body lasts as long as the car itself you are not getting a full measure of satisfaction or a full return for the dollars you have invested.

You want a body free from squeaks and rattles. You want one with a substantial "feel" to it. You want one that will stand up under the strain of thousands of miles of driving.

You are most apt to find those things in a body built of wood and steel—for combination wood-and-steel construction has many advantages.

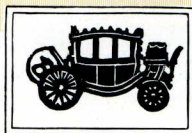
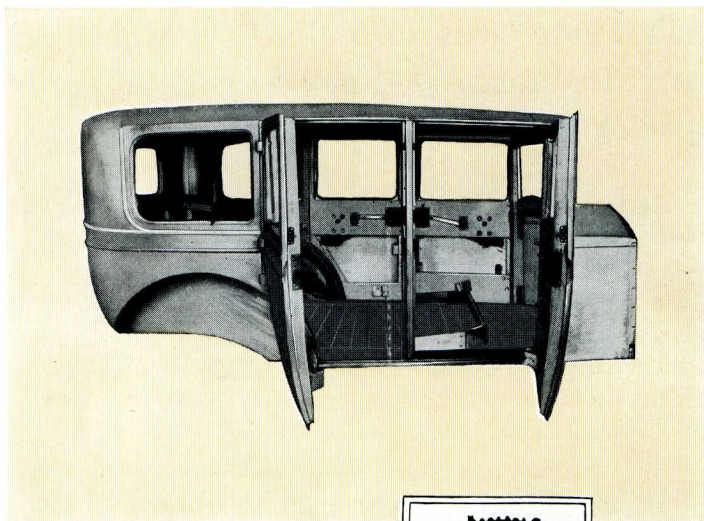
This type of body possesses unusual strength—for the wood reinforces the steel, and the steel reinforces the wood.

It is not too rigid to give and flex as the car passes over bumps or turns a corner—for strong hardwood gives it flexibility.

It provides unusual safety—for both wood and steel protect you—and if it is of really fine quality the roof will be of sturdy slat-and-bow construction.

It makes possible many refinements—such as the accurate fittings of doors.

And it offers many other advantages of similar nature.



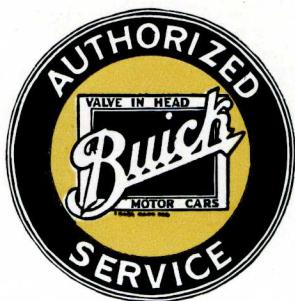
Buick's Fisher Bodies

Bodies by Fisher are known the world over for their perfection of design, their sturdiness of construction and their painstaking craftsmanship. They are of combination wood-and-steel construction, and experiments with all types of bodies and years of experience in body-building have convinced Fisher that bodies of wood-and-steel are superior from every standpoint.

Buick bodies by Fisher, like the Buick chassis, provide extremely long life, safety and freedom from attention—and they give you the additional qualities of beauty, comfort, luxury and style in the highest degree.

Ask These Questions Before Purchasing Any Automobile—*They Provide a Yardstick by Which to Measure Motor Car Value*

<i>Question</i>	BUICK	Check Any Other Car
HAS THE CAR A—		
Valve-in-head engine?.....	YES	.....
Counterbalanced crankshaft?.....	YES	.....
Torsion balancer?.....	YES	.....
Multiple dry disc clutch?.....	YES	.....
Air cleaner?.....	YES	.....
Oil filter?.....	YES	.....
Gasoline strainer?.....	YES	.....
Crankcase ventilator?.....	YES	.....
Thermostatic circulation control?.....	YES	.....
Automatic and manual carburetor heat control?.....	YES	.....
Forced feed lubrication?.....	YES	.....
Engine mountings of resilient rubber, both front and rear?.....	YES	.....
Torque-tube drive?.....	YES	.....
Cantilever springs?.....	YES	.....
Hydraulic shock absorbers both front and rear?.....	YES	.....
Low-slung bodies?.....	YES	.....
Double-drop frame?.....	YES	.....
<i>Mechanical</i> external 4-wheel brakes?.....	YES	.....
One universal joint instead of two?.....	YES	.....
Is chassis sealed against dust, dirt and water?.....	YES	.....
Are the spark plugs protected?.....	YES	.....
Is the body of combination wood and steel construction?.....	YES	.....
Who makes it?.....	FISHER	.....



☞ Buick Authorized Service ☞

Buick Authorized Service brings additional security and satisfaction to every Buick owner.

For he knows that wherever he sees this sign he will find prompt, efficient, courteous service; a staff of expert mechanics trained in Buick work; and a stock of genuine Buick parts.

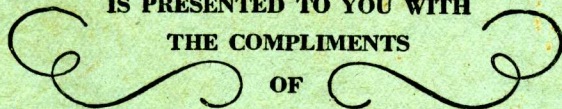
He knows that service charges will be moderate.

And he knows that no matter where he may be, he can expect the same fine Buick service he is accustomed to receiving from the Buick Authorized Service station in his own community.

Buick Authorized Service is always within hailing distance. It is as near to you as your telephone anywhere in America. And there are Buick Authorized Service stations in every civilized section of the world.

You buy this service when you buy your Buick. It is a part of Buick's extra value.

THIS
VALUABLE BOOKLET
IS PRESENTED TO YOU WITH
THE COMPLIMENTS
OF

A decorative flourish consisting of two symmetrical, swirling lines that curve upwards and outwards from the word 'OF', framing it.

TODD-BUICK COMPANY

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PLATTSBURG, NEW YORK

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