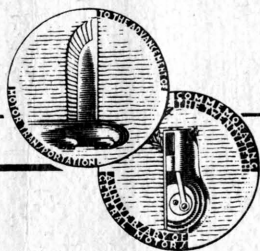


14

The Automobile **BUYER'S • GUIDE**



1934 EDITION

A sequel to "*The Proving
Ground of Public Opinion*"
—reflecting the views of
211,000 motorists responding
to General Motors consumer
research surveys.



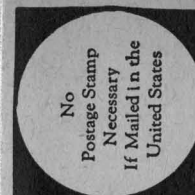


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The Automobile



BUSINESS REPLY CARD

First Class Permit No. 2094, Sec. 510 P. L. & R. Detroit, Mich.

General Motors Corporation
3044 West Grand Boulevard
Detroit, Michigan



ROOM 14-202

CUSTOMER RESEARCH STAFF
GENERAL MOTORS—DETROIT, MICH.

Copyright 1934



GENERAL MOTORS—DETROIT

I think these people may buy new cars this year and would suggest that you send them copies of your *Automobile Buyer's Guide*.

NAME _____
PLEASE PRINT

STREET _____

CITY _____ STATE _____
*

Make of Car Owned _____

NAME _____
PLEASE PRINT

STREET _____

CITY _____ STATE _____
*

Make of Car Owned _____

NAME _____
PLEASE PRINT

STREET _____

CITY _____ STATE _____
*

Make of Car Owned _____

Accelerator
Accuracy of Workmanship
Adjustable Front Seat
ADVERTISEMENT
Air Cleaner
APPEARANCE
Arm Rests
Ash Trays
Assist Cords

Bacillus Auto-Butylicum
"Balance"
BARTON, BRUCE
Battery
"Behind the Scenes"
"BLINKING MACHINE"
Body
Body Hardware
Brakes
Bumpers
Buying Motives

Carburetor
CAR IN GLASS CASE
Chassis
Check Sheets
Choke, Automatic
Clutch
Color
COMFORT 7, 12-15,
CONCLUSION
Controls, Door and Window
Controls, Foot
Controls, General
Cooling System
Cowl Ventilator
Craftsmanship
Crankcase Ventilation
Crankshaft
Curtains
Cushions

Dash Compartment
Dash Insulation
Dashlight
Dealer
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DEPENDABILITY 7, 12, 13, 15, 18, 19, 27, 32, 47, 59
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Door Locks
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Keys
"KNEE ACTION" See Individual Front Wheel Suspension
Light Switches
Locks
Lubrication
Luggage Space
Manifold Construction

(Index Continued on Inside Back Cover)

The Automobile BUYER'S GUIDE

We asked owners this question:

"In choosing a car, whose advice would you seek?"

They answered:

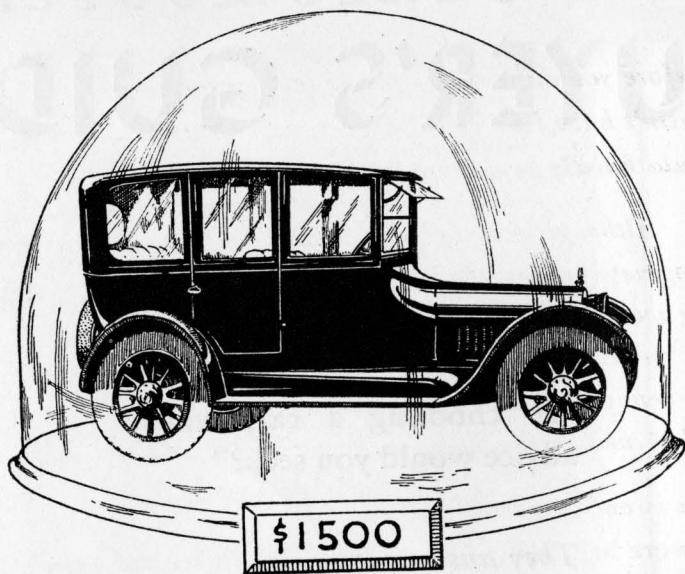
"The advice of other owners."



*—this little book brings you the advice
of over 200,000 "OTHER OWNERS."*

CUSTOMER RESEARCH STAFF
GENERAL MOTORS—DETROIT, MICH.

Copyright 1934



A CAR IN A GLASS CASE

Suppose that ten years ago a brand new model had been sealed up in a glass case—this case was sealed so tight that nothing could happen to the car since then. So here it is today, in perfect condition, no dust—no rust—no wear—no tear—no tarnish.

In 1924 the price of this car was \$1,500. What would you give for it today?

—but before you decide, let's take a look at the car:

It doesn't have four wheel brakes, balloon tires, or Duco finish and could hardly be described as a streamlined design!

Although the engine is almost the same size as the engines of today, this earlier model would not climb hills so well nor run so fast. Nor would you care to drive it so fast because it doesn't run smoothly, it tends to bounce around on the road, it steers hard and doesn't ride nearly so comfortably as an up-to-date model.

And this is only a part of the story:

If you were to carefully check this "car in a glass case" against the more advanced 1934 designs you would find literally hundreds of improvements that were lacking in this earlier model.

Of course very few people are driving cars that are as old as the car in the glass case—but the comparisons are almost as startling if we had put a five year old car (or even a four year old car) in our glass case.

* * *

There is perhaps no similar period in automotive history that has brought forth so many improvements and refinements in motor car design as the past five years.

It is one of the aims of this book to review these developments, not so much from a standpoint of their engineering and scientific significance, but in their relation to the tastes and desires of the practical motorist as disclosed through our extensive consumer surveys among owners of all makes of cars.



THIS is an era of careful buying. It is popular to be a "Good Buyer".

Next to the home and the insurance policy, the automobile is probably the most important purchase that the average person makes in a lifetime.

Experienced motorists tell us that they plan their purchases many months in advance - reviewing their past experiences, posting themselves on new features of design, consulting with other owners and then weighing all the evidence.

"THE AUTOMOBILE BUYER'S GUIDE" has been developed for just such people. It is designed to aid you in your deliberations.

While we naturally hope that it may help General Motors to sell more automobiles, it is not designed along the lines of the usual sales message - in fact the names of General Motors cars are not even mentioned except back on Page 80.

Perhaps some of you may be good enough to write us a little note giving us the benefit of your reactions after you have read this book - and if it should develop that this departure in automobile literature seems to fill a real need, we may make its publication an annual affair - as an added feature of General Motors service to the Motoring Public.

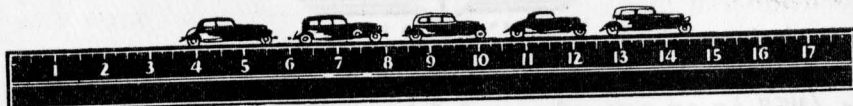


CUSTOMER RESEARCH STAFF

General Motors
Detroit, Michigan



New Measuring Sticks of Value



"Advances in Engineering Design, improvements in highways, uninterrupted winter usage, changes in motoring habits, higher speeds and greater distances, less frequent trading—these new conditions bring new measurements of value which the experienced motorist stresses when choosing his new car."

* * * *

It was the original purpose of CLOTHING to cover one's body and protect it—but now that all clothes will do this, garments are



no longer bought entirely from this standpoint—we consider details of comfort, durability and style. "Does it fit around the shoulders?"

"Will it hold its shape?" "Do the arms and legs have freedom of movement?" "Is the fabric all wool—and preshrunk?" "Is the color



pleasing and will it hold fast?" "Is the needle work fine or coarse?"

It is the fundamental purpose of the MOTOR CAR to provide individual transportation but with the advances in engineering design during recent years, and the increasingly fastidious tastes of the experienced motoring public, we expect more of a car than merely "Will it run?"



It is perhaps a compliment to the automobile manufacturer—that such fundamentals were mentioned so infrequently by people answering our questionnaires—and while no experienced motorist would think of accepting a car of poor performance, it seems that the typical buyer of today is not satisfied to accept a car merely on the basis of its performance.



The items most frequently stressed are details which, one might say, are more or less insignificant within themselves, but

which, taken collectively, might mean the difference between satisfactory motoring and unsatisfactory motoring. It must be remembered that cars are being driven farther and faster than ever before. They are being driven in winter as well as summer, *in all kinds of climates and over all types of roads.*

Then, too, the typical owner of today is driving a rather old car. This means that, unless his present car was very carefully chosen, he is being confronted with many annoying problems of repair and maintenance that he may have formerly escaped through frequent trading.

DETAILS OF DESIGN AFFECTING LONG TERM MAINTENANCE AND OPERATING COSTS loom up in his mind as being far more important than in the past—and all this has a very definite bearing on the selection of his new car which he is buying on the assumption that he may keep it three years, four years, five years—or even longer!

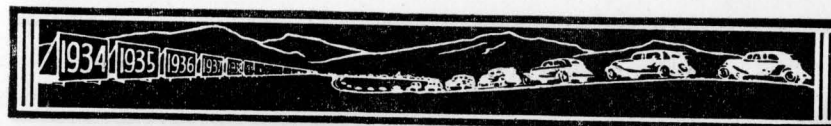
So it is only natural that these new conditions should bring new measurements of value which the experienced motorist stresses.

What are these new measuring sticks?

What are the details which the experienced buyer stresses?

General overall characteristics such as "DEPENDABILITY," "ECONOMY," "SAFETY," "COMFORT," "EASE OF CONTROL," "APPEARANCE," "PICK-UP," etc., came in for considerable discussion and the relative standing of these important considerations as influencing the buyer's choice, are shown on Page 13.

The majority of the comments, however, went beyond the discussion of mere generalities: "Positive brakes—easy to operate, but SMOOTH in action,"—"sag-proof and rattle-proof doors that make a mellow sound when you slam them,"—"more substantial body hardware,"—"bumpers that won't catch the other fellow's car,"—"adequate provision for lubrication,"—"non-clash gear shift,"—"less insolent horns,"—these are more or less typical





of the things that were stressed.

It seems that the approach to mechanical perfection as reflected in the motor car of today has served to bring more definitely into focus the fact that *the automobile is more than just a piece of machinery.*

Many of the points brought out in our surveys do not even appear in the typical automobile catalog or table of specifications, nor are they readily observed in the usual demonstration.

It's hard to put them into words.

Perhaps the best way to express the general idea is to paraphrase the comment of one motorist who declared that:

"The MENTAL EASE of the driver is the most desirable feature that can be built into a car."

Or, as a woman driver expressed it:

"The modern car is really a kind of SERVANT and perhaps there is no better way to sum up what I expect from my car than to consider what one expects from a servant."

"We expect a servant to be dependable, efficient, amiable, ready to go at our bidding—ready to adapt themselves to our wishes, ready to serve us willingly, pleasantly—and without 'back talk'."

Or, as still another user wrote in, that above all else he desired:

"—a companionable sort of a car to which I would feel a growing attachment and satisfaction throughout a long period of usage."

So it becomes increasingly obvious that the designer must look beyond the engineering handbooks and interest himself in physiology, psychology and even neurology.



As one of our engineers recently expressed it:

"The motor car does not become a complete mechanism until the driver is back of the wheel. The steering apparatus doesn't end at the steering wheel—any more than does a good braking system end with the foot pedal or the hand lever—bones, muscles, sinews, nerves, human temperaments, instincts, and habits must all be taken into account by the true engineer."

The operation of the controls must conform to the most natural movements of the feet, legs and arms. The design of a little thing like a foot throttle must not only take into account the strength of materials and the laws governing mechanical links and levers, but it must also consider the physiology of the leg muscles and the possibility of nerve strain in long distance travel.

The design of a restful seat must reckon with anatomy. The back of the seat should be at an angle conforming to the natural posture of the human body.

But here's an interesting point that is recognized in physiological research and which was amply confirmed by comments from car owners:

Relaxation comes not so much from sitting in an ideal seat, but by frequently changing from one position to another.

Next time you are in a room with lots of people sitting around in easy chairs just notice how few of them are sitting in the position that the chairmaker had in mind when he designed the contour of the seat and back.

So it is perhaps only natural that an adjustable driver's seat was "voted" as one of the most important factors in selecting a new car.



Experienced motorists emphasized the point that it is not so much a matter of adjusting the front seat to suit their height but a matter of changing the position of the front seat in order to get muscle and nerve relaxation in long distance driving.

Needless to say, this advantage is not available unless the seat can be adjusted with minimum effort right while you are driving along.

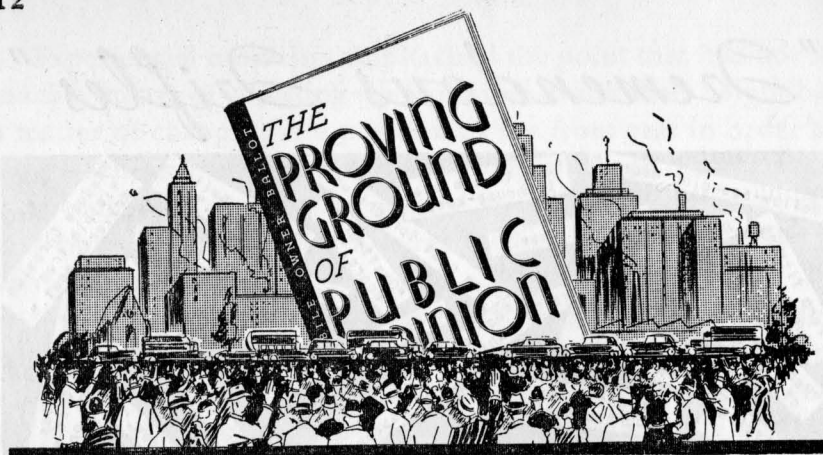
Other items receiving a "heavy vote" were: Larger gas tanks - bigger tires - heavy duty storage batteries - accessible tire valves - accurate dash instruments - 3-spoke steering wheels for better visibility of instruments - a reduction in the number of keys that the motorist must carry, etc.

The foregoing gives you some idea as to the kinds of things that have come out of our Customer Research studies -

“—trifles, one might say—but TRIFLES of tremendous importance.”

"Tremendous Trifles"





IT WOULD be out of keeping with the purpose of this book to try to tell you what car to buy. We will not even attempt it. Different motorists have different requirements and differences in climates and road conditions also affect the desirability of certain features.

On the other hand, there are certain broad fundamental considerations that are important from the viewpoint of any motorist, irrespective of his individual problems.

In our questionnaire, "*The Proving Ground of Public Opinion*," car owners were invited to "vote" for the general characteristics that they considered most important. The chart at the bottom of the next page shows how the "ballot" stands at the time this book goes to press.

"DEPENDABILITY" ranks at the top of the list with "OPERATING ECONOMY" and "SAFETY" next. Then come "APPEARANCE," "COMFORT," "EASE OF CONTROL," "SMOOTHNESS," "PRICE," etc.

You will note that SPEED is at the bottom of the list. This does not mean that SPEED is unimportant but it *is* perhaps significant as further emphasizing the fact that *dependability and all around utility* are the more dominant buying motives at the present time.

Now then, before going any further it should be pointed out that there is really no clean cut dividing line between many of these characteristics:

"OPERATING ECONOMY" and "DEPENDABILITY"

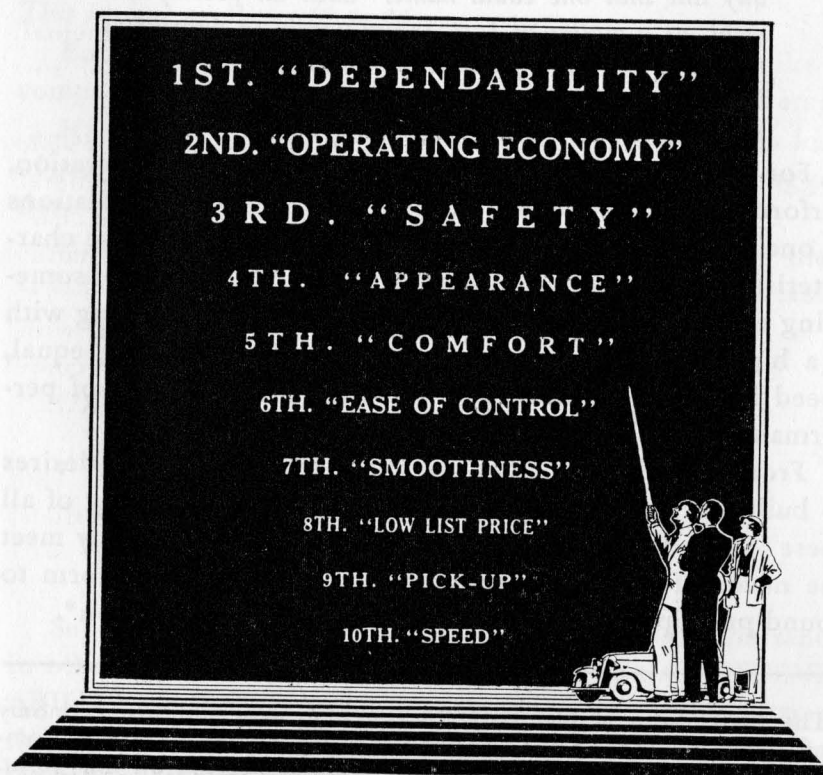
are closely related. "EASE OF CONTROL" can't very well be divorced from "SAFETY." "COMFORT" and "SMOOTHNESS" merge into one another, etc.

A number of owners answering our questionnaire laid great emphasis on this interrelation in checking their answers.

Some motorists who voted "ECONOMY" as the outstanding consideration pointed out that a failure to consider "smartness" in appearance would work at cross-purposes to economy when the time comes to trade the car in on another one. In other words, entirely aside from aesthetic considerations, advanced styling, *provided it conforms to sound good taste*, tends to slow down the rate of depreciation.

Others commented on "Speed" as an essential to "Safety" and a little reflection will show the soundness of that statement.

HOW MOTORISTS VOTED



"'For,' said the Deacon, 'it's mighty plain
That the weakest place must stand the strain,
And the way to fix it, as I maintain,
Is only jest
To make that place as strong as the rest.'"



In answering this particular series of questions, owners also emphasized the importance of having a *well-balanced design* – in other words a car representing a happy combination or blending of all these important factors.

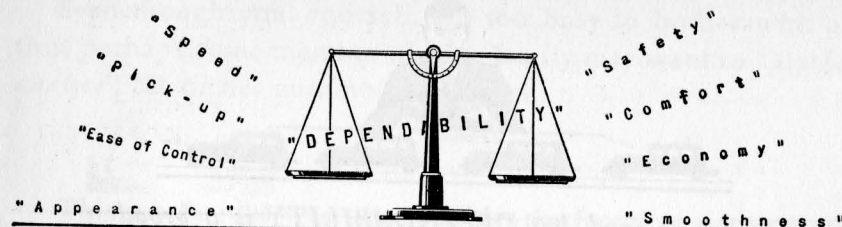
This brings up one of the most important fundamentals of automotive engineering – a point that is perhaps not generally recognized:

With the present-day high development of engineering skill and manufacturing technique it is possible to build into a car an exaggerated characteristic along almost any line that one could name. Such an accomplishment, as a matter of fact, is not nearly so difficult as the designing of a product in which there is a well-balanced relation between the various aspects of performance, style, comfort, economy, etc.

For example, take the characteristics of speed, acceleration, performance and economy, all of which bear definite relations to one another. Beyond a certain point no one of these characteristics can be built into a car except at the expense of something else. Thus, excessive power must of necessity bring with it a higher operating cost, and all other things being equal, speed beyond a certain point penalizes other features of performance.

From this it seems clear that the manufacturer who desires to build for permanency must aim at a skillful blending of all these "ingredients" in proportions that will most nearly meet the needs of the customer and at the same time conform to sound principles of engineering design and construction*.

*The Buyer who is primarily interested in dependability, economy and *HIGH ULTIMATE TRADE-IN VALUE* would do well to compare the policies of different manufacturers as bearing on this point.



Most of these terms are rather general and indefinite: **DEPENDABILITY** is not entirely a matter of ruggedness in design. **ECONOMY** involves many factors besides gas and oil consumption. **COMFORT** cannot be described in terms of leg room and upholstery and an adequate consideration of **SAFETY** extends beyond the question of safety glass and good brakes.

So we thought it might be helpful to list under each of these general terms some of the detailed considerations that motorists have repeatedly stressed in their answers to our questionnaires. *This is done on Pages 18 to 34.*

But before getting into the details perhaps you'd like to compare your personal "Vote" with that of the Average.

If you have a little time to spare – and want to make a kind of game out of planning for your next car, the following suggestions may be of interest:

First check off the General Characteristics marking them 1, 2, 3, 4, etc. in what *YOU* consider their order of importance:

- | | |
|--|-------------------------------------|
| <input type="checkbox"/> Appearance | <input type="checkbox"/> Economy |
| <input type="checkbox"/> Comfort | <input type="checkbox"/> Pick-up |
| <input type="checkbox"/> Dependability | <input type="checkbox"/> Safety |
| <input type="checkbox"/> Ease of Control | <input type="checkbox"/> Smoothness |
| <input type="checkbox"/> Low Price | <input type="checkbox"/> Speed |

Suppose you rank "**DEPENDABILITY**" as most important – in other words, more than anything else, you want **DEPENDABILITY** in your next car – you want a car that will "stay put," that can always be relied upon – that you can continue to run for four years, five years, six years – or even longer.



*So far so good, but **DEPENDABILITY** is a broad general sort of quality. It can't be ordered "BY THE POUND OR BY THE YARD." It depends on dozens of different things and on the relations of these things, one to another.*

Now turn to Page 19, study the items which motorists have listed as contributing to **DEPENDABILITY** and from your personal viewpoint, check off, let us say, the five most important considerations bearing on **DEPENDABILITY** and **LONG LIFE**.

Then rate them (1, 2, 3, 4, 5) according to your judgment and practical experience.

This "game" can be carried further and might perhaps sharpen your "buying wits" provided you have a little time to spare:

Let's assume that on the previous page you have ranked **COMFORT** as the second most important attribute of a motor car.

Turn to Page 28, and check off the five items which, from your standpoint, represent the most vital ingredients that go to make up **COMFORT** - *and so on*.

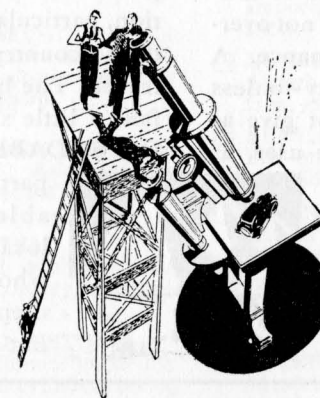
Then follow the same procedure with each of the other **GENERAL CHARACTERISTICS** which are discussed in the following pages.

Further reference is made to this in the back of this book where detailed forms are provided for your convenience in laying out the specifications of your next car.*

*Perhaps we are getting into too much detail - but lots of people said that automobile advertising didn't give them as much information as they'd like to have *and we don't want you to be able to say that about US any more.*

Even though you, yourself, are too busy to bother with all this, perhaps some member of your family may want to "psycho-analyse" his or her automobile desires.

This whole idea was prompted by the fact that many people complimented our questionnaire on the grounds that it was "LIKE A GAME OR A CROSS-WORD PUZZLE." - "LIKE PLAYING AN INTERESTING HAND OF BRIDGE - PICKING AN ALL AMERICAN FOOTBALL TEAM - OR PLANNING FOR A SPRING HAT." This is nothing more than an extension of the same idea. We are hopeful that it may prove equally interesting and certainly it should prove **MORE** profitable because *it should help you to buy more carefully. In filling out our questionnaire you were helping US back at the engineering and manufacturing end of the business, whereas checking off the items in this book should prove helpful to YOU from your standpoint as a BUYER!*



DEPENDABILITY



The primary purpose of the modern motor car is to serve its owner. If a car is not **DEPENDABLE** the primary reason for its existence is threatened.

There are literally hundreds of things that contribute *to* or detract *from* **DEPENDABILITY**—a whole book could be written on just this one subject alone.

Owners define **DEPENDABILITY** as meaning "freedom from trouble," and freedom from trouble depends upon proper design, good workmanship and careful assembly of the parts and units into a complete vehicle.

Over on pages 36 to 60 there are some interesting sidelights on what goes on "Behind the Scenes" to insure maximum dependability in your new car.

While on this subject of **DEPENDABILITY** we must not overlook service and maintenance. A product of highest quality—unless well serviced, might not give as much satisfaction to the user, as a product of lesser quality but supported by good service.

Good service depends upon readily available repair parts, adequate

facilities and equipment, with local service talent that is skilled in all phases of repair and maintenance operations.

—but even these will not suffice—service must not only be efficient, complete and easily available, but it must be rendered with friendliness and human understanding. *IT MUST BE PLEASING AS WELL AS HELPFUL.*

Owners commenting on **DEPENDABILITY** laid special emphasis on service, for example:

"I carefully consider service policies and the extent and expertness of the service organization, particularly in those sections of the country where I frequently travel. The best car in the world falls a little short of **ABSOLUTE DEPENDABILITY** unless repair

parts are readily available at conveniently located service stations who know how to put them in—and do it without overcharging me."



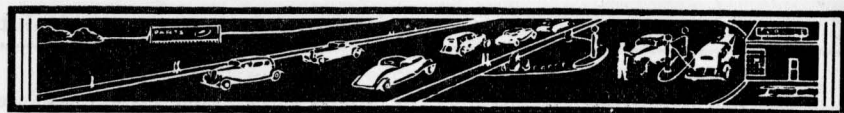
*So now let us review the table on the opposite page which shows some of the details—not all of them by any means, but enough to typify the kind of things which should be considered under the broad heading of **DEPENDABILITY**.*

DEPENDABILITY

☒ Check off the items that are most important from your standpoint

- | | |
|---|---|
| <input type="checkbox"/> ACCURACY OF WORKMANSHIP
Insures dependable performance and long life. | <input type="checkbox"/> ENGINEERING DESIGN
Motor, chassis and body. (Glance over pages 37-60.) |
| <input type="checkbox"/> AIR CLEANER
Keeps dirt out—lengthens life of engine. | <input type="checkbox"/> FRAME
Should be of rugged, well braced type, providing ample rigidity. |
| <input type="checkbox"/> AUTOMATIC CHOKE
Dependable starting at all times. | <input type="checkbox"/> GENERATOR
Should automatically compensate for load to insure fully-charged battery at all times. |
| <input type="checkbox"/> AUTOMATIC MANIFOLD HEAT CONTROL
Insures dependable operation and economical fuel consumption. | <input type="checkbox"/> INDIVIDUAL FRONT WHEEL SUSPENSION ("Knee-Action")
More sturdy—wheels cannot get out of alignment. (See pages 48-53.) |
| <input type="checkbox"/> AUTOMATIC SHOCK ABSORBERS
Prolong life of structural and mechanical parts—prevent road shocks from affecting fine adjustments. | <input type="checkbox"/> JACK
Ample capacity and of practical design. |
| <input type="checkbox"/> AUTOMATIC SPARK CONTROL
Insures proper firing. | <input type="checkbox"/> LUBRICATION
Adequacy and accessibility. |
| <input type="checkbox"/> BATTERY
Strong vote for larger and heavier duty battery. | <input type="checkbox"/> OCTANE SELECTOR
Permits adjustment for variations in different grades of gasoline, to eliminate "pinging." |
| <input type="checkbox"/> BODY "HARDWARE"
Such as door, window and front seat controls. Should be substantial in design—dependable and easy to operate. | <input type="checkbox"/> REPAIR PARTS
Should be readily available—in emergency cases saves time, trouble and expense. |
| <input type="checkbox"/> BRAKING SYSTEM
Smooth in operation—positive under all conditions and requiring minimum attention. (See page 22.) | <input type="checkbox"/> REPUTATION OF MAKER
Best overall assurance of dependability. |
| <input type="checkbox"/> CARBURETOR
"The Heart of the Engine"—unfailing carburetion necessary for dependable performance. | <input type="checkbox"/> ROAD CLEARANCE
Important on poor roads and in heavy snow. |
| <input type="checkbox"/> COOLING SYSTEM
Dependable performance under ALL conditions demands adequate capacity with thermostatic control. | <input type="checkbox"/> RUBBER MOUNTINGS
Absorb vibration—protect machine from jolts and shocks. (See page 26.) |
| <input type="checkbox"/> DOORS
Snug fitting—adequately hinged and over-lapping design. Ask dealer to explain "coach sill effect"—prevents sagging. | <input type="checkbox"/> SERVICE
See previous page—also Item 7, page 78. |
| <input type="checkbox"/> ELECTRICAL SYSTEM
Increasing electrical equipment demands well designed, heavy duty system, well insulated. | <input type="checkbox"/> SPRING SHACKLES
Should be self-adjusting and self-lubricating. |
| <input type="checkbox"/> ELECTRO-PLATED PISTONS
Reduce friction—minimize possibility of piston seizing and cylinder scoring—add to life of engine. | <input type="checkbox"/> STARTING SYSTEM
Adequate capacity for cold weather operation—must not stick or jam. |
| <input type="checkbox"/> ENGINE
Always quick to start—not easily stalled under load or when idling in traffic. | <input type="checkbox"/> STEERING APPARATUS
Must be of sturdy construction and proof against "shimmy." (See pages 48-53.) |
| | <input type="checkbox"/> WINDSHIELD WIPER
High quality—positive, uninterrupted action. |

OPERATING ECONOMY



Some people are inclined to think of ECONOMY primarily in terms of gasoline and oil consumption. This is only natural because few other expenses are paid, as one might say, "by the mile." Every day or so the motorist is unpleasantly reminded of gasoline and oil expenses.

Economy in gas and oil is dependent on such things as size, weight, shape, performance, and skillful engineering design—but the fact that *Dependability* was given a higher rating than Economy indicates that the majority of automobile owners have a broad conception of Economy—extending beyond the consideration of fuel and oil expense.

Other things affecting this important question of Economy might be summarized as follows:

*Miscellaneous Operating Cost
Maintenance and Repairs
Future Trade-in Value*

Such expenses occur less frequently than the outlays for oil and gas and it is human nature to forget the things that we are not reminded of at frequent intervals, in fact the necessity for some of these things does not occur until after 30,000 or even 50,000 miles, depending on the design and construction of the car.

But the infrequency of their occurrence in no sense lessens their significance and the far-sighted buyer does not overlook these important factors of economy. In weighing this



important question of economy we hope you will read the chapter on "Smoothness" beginning on page 26. Also pages 48 to 53.

As a buyer, you are entitled to a car that is economical in fuel and oil in relation to its characteristics of performance. You should not be satisfied with any inefficiencies on these important counts. But as one experienced motorist expressed it:—"It's almost impossible to save enough in fuel and oil expense to offset the ultimate extravagance of driving a car whose reputation will work at cross purposes to its future resale value."

Fortunately, good reputation and high trade-in value go hand in hand with economical operating characteristics. Take a car which has enjoyed a high resale value over a period of years and it will be found that it has earned its standing primarily through its overall operating economy.

Remember too, that sound styling retards depreciation from an appearance standpoint. See page 24.

—and be sure to read page 32

OPERATING ECONOMY

☒ Check off the items that are most important from your standpoint

- | | |
|---|---|
| <p><input type="checkbox"/> ACCESSIBILITY
Saves time and money incident to maintenance.</p> <p><input type="checkbox"/> AIR CLEANER
Removal of dirt protects engine, spark plugs and oil.</p> <p><input type="checkbox"/> ASH TRAYS
Save carpets and upholstery.</p> <p><input type="checkbox"/> AUTOMATIC CHOKE
Eliminates hand choke button and safeguards against flooding.</p> <p><input type="checkbox"/> AUTOMATIC MANIFOLD HEAT CONTROL
Maintains proper manifold temperature for greatest fuel efficiency and economy.</p> <p><input type="checkbox"/> AUTOMATIC SPARK CONTROL
Insures firing at exactly the proper time to obtain the maximum power from the gasoline burned.</p> <p><input type="checkbox"/> BATTERY
Heavy duty and properly protected.</p> <p><input type="checkbox"/> BODY
Composite construction may be economically repaired in case of damage.</p> <p><input type="checkbox"/> CARBURETOR
Read last half page 34.</p> <p><input type="checkbox"/> COOLING SYSTEM
Thermostatic control insures efficient engine temperature.</p> <p><input type="checkbox"/> CRANKCASE VENTILATION
"Most important economy improvement in modern times." (See page 45.)</p> <p><input type="checkbox"/> CUSHIONS
Made of sturdy, wear-resisting material that will not show spots.</p> <p><input type="checkbox"/> ELECTRO-PLATED PISTONS
Reduce friction—prolong life of engine. Better compression and power through closer fitting. Possibility of scoring cylinders practically eliminated.</p> <p><input type="checkbox"/> ENGINE
Maximum power for fuel consumed. (See pages 34, 43, 44, 45, 47.)</p> <p><input type="checkbox"/> ENGINE HEAT CONTROL
Water temperature thermostatically controlled, insures quick starting and gas economy in cold weather.</p> | <p><input type="checkbox"/> FENDER VALANCES
Scientific developments in fender design protect car from mud and water splashing which safeguards finish and reduces washing expense. (See page 24.)</p> <p><input type="checkbox"/> FINISH
Should be lasting, non-fading, non-tarnishing, non-corrosive.</p> <p><input type="checkbox"/> FUEL PUMP
Assures a measured gas supply, metered strictly in accordance with the needs of the engine.</p> <p><input type="checkbox"/> GENERATOR
Fan cooled, variable charging rate. By keeping battery fully charged at all times, life of the battery is measurably prolonged.</p> <p><input type="checkbox"/> INDIVIDUAL FRONT WHEEL SUSPENSION ("Knee-Action")
Lessens twisting and straining of entire car, contributes to longer car life and slow depreciation.</p> <p><input type="checkbox"/> LUBRICATION
Efficient and accessible. Check manufacturer's service agreement policy.</p> <p><input type="checkbox"/> MANIFOLD CONSTRUCTION
(See page 34.)</p> <p><input type="checkbox"/> OCTANE SELECTOR
Permits use of high or low test fuel.</p> <p><input type="checkbox"/> PROPER BALANCE
Turns vibration into useful work. (See page 46.)</p> <p><input type="checkbox"/> RADIATOR DRAIN TAP
Design and location should permit salvaging anti-freeze.</p> <p><input type="checkbox"/> RADIO AERIAL
Built-in.</p> <p><input type="checkbox"/> REPUTATION OF MANUFACTURER
Permanency and stability of manufacturer insurance against excessive depreciation when the time comes to trade.</p> <p><input type="checkbox"/> RUBBER MOUNTINGS
Eliminate vibration and protect vital mechanisms.</p> <p><input type="checkbox"/> SERVICE
Consider policies and facilities. Check prices and availability of repair parts.</p> <p><input type="checkbox"/> TRANSMISSION
"Synchro-Mesh" longer-lived due to smooth operation.</p> |
|---|---|

S A F E T Y



When you take your position behind the wheel of the modern motor car, you have at your personal and instantaneous command more power than was available at the finger-tips of any human being in the world — **UP UNTIL JUST A FEW YEARS AGO.**

This modern instrument of INDIVIDUAL POWER can be made to serve thousands of useful purposes or it may become a menace in an equal number of ways.

Since the safety of the streets and the highways is a matter of broad and vital public interest, the manufacturer, the motorist and the public at large are naturally interested in anything and everything that tends to make motoring safer.

In the "PROVING GROUND OF PUBLIC OPINION" this question of SAFETY brought a great number and a great variety of comments from owners.

Among the newer features SAFETY GLASS loomed up as being extremely desirable. It was pointed out, however, that, if the glass is not of highest quality — *proof against disintegration and discoloration* — it becomes really *less safe than ordinary glass.*

Inside door handles and window cranks "*that won't catch coat sleeves*" were mentioned as being an even more important safety factor than safety glass on the grounds that, while safety glass provides a safeguard against the seriousness of an accident, these

latter details actually help to PREVENT accidents.

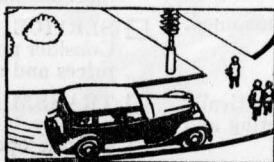
Few items covered in our investigation came in for as much mention as the subject of BRAKES.

Higher speeds of travel and greater congestion of the highways put an increasing responsibility on the braking system.

From the all-important standpoint of safety this question of brakes stands at the top of the list. Above all, the brakes must be positive in their operation and dependable under all conditions. They must be easy to apply, quick to respond and smooth in their operation. No less than 100 per cent efficiency and reliability can be tolerated in the braking system.

Although it is discussed under COMFORT, the new independent front wheel mounting makes a distinct contribution to safety. This emphasizes the fact that SAFETY and COMFORT are in many respects very similar. Anything that makes for Comfort, Ease of Operation and Freedom

from Fatigue — in fact everything that affects either PHYSICAL or MENTAL EASE makes a definite contribution to SAFETY.



S A F E T Y

☒ Check off the items that are most important from your standpoint

- | | |
|--|---|
| <input type="checkbox"/> AIR CLEANER
Serves as flame arrester in backfiring. | <input type="checkbox"/> REFLEX LENS
Provides protection in case of tail light failure. |
| <input type="checkbox"/> AUTOMATIC SHOCK ABSORBERS
Protect passengers against sudden shocks and jolts. | <input type="checkbox"/> REPAIR PARTS
Consider general availability of genuine parts. |
| <input type="checkbox"/> BALLOON TIRES
Motorists voted for "oversize balloons" which give greater traction and braking. | <input type="checkbox"/> RIDE STABILIZER
Eliminates objectionable sensation of body roll or sway when driving over uneven roads or around corners. |
| <input type="checkbox"/> BODY
Steel plus wood provides greater strength and resiliency. | <input type="checkbox"/> ROAD CLEARANCE
Should allow for driving on poor roads and in deep snow. |
| <input type="checkbox"/> BRAKING SYSTEM
Most important of all SAFETY features. Positive and unfailing operation absolutely essential. | <input type="checkbox"/> SAFETY GLASS
90 per cent voted for this — <i>but it must be of highest quality.</i> |
| <input type="checkbox"/> BUMPERS
Should provide adequate protection — check width, also height from ground. | <input type="checkbox"/> SERVICE
At home and elsewhere — it should be expert and thorough. |
| <input type="checkbox"/> DASHLIGHT
Visibility of instruments without unnecessary, dangerous glare. | <input type="checkbox"/> SPEED
"— an essential safety factor." (See pages 13, 34.) |
| <input type="checkbox"/> DOOR and WINDOW CONTROLS
Should not catch coat sleeves. (See previous page.) | <input type="checkbox"/> STEERING APPARATUS
Of utmost importance to safety. Absolute reliability under all conditions essential. New "Knee-Action" construction improves steering. (See pages 48-53.) |
| <input type="checkbox"/> FRAME
"Backbone of entire car." Should provide sufficient strength and rigidity. Low "Center of Gravity" important for road stability and safety. | <input type="checkbox"/> TREAD
Adequate width essential for safe driving, especially on unimproved roads. |
| <input type="checkbox"/> GAS TANK
Mounted at rear and well protected. | <input type="checkbox"/> TRIMMINGS — CHROMIUM
Majority of motorists voted for "restrained use of chromium." |
| <input type="checkbox"/> HEADLIGHTS
Adequate illumination of the road — but with safety to other drivers. | <input type="checkbox"/> VENTILATORS
Screened to prevent insects entering car. |
| <input type="checkbox"/> HEADLIGHT DIMMER CONTROL
Accessible and operated with least possible effort and movement. | <input type="checkbox"/> VENTILATION
Circulation of air to expel injurious fumes and unpleasant odors essential — <i>but without drafts.</i> (See pages 54 to 57.) |
| <input type="checkbox"/> HORN
Rich, musical tone, sufficiently penetrating without paralyzing effect. | <input type="checkbox"/> VISION
Narrow front corner posts and large rear windows add to safety. |
| <input type="checkbox"/> INDIVIDUAL FRONT WHEEL SUSPENSION ("Knee-Action")
Minimizes danger from blow-outs. (See pages 48-53.) | <input type="checkbox"/> WINDSHIELD
Should be set at proper angle to eliminate glare. |
| <input type="checkbox"/> INSTRUMENTS
Readily visible and accurate. | <input type="checkbox"/> WINDSHIELD WIPER
Dependability and efficiency essential to safety. |
| <input type="checkbox"/> LOCKS
Theft-proof. | |
| <input type="checkbox"/> REAR VIEW MIRROR
Of adequate size, non-glare. | |

APPEARANCE



"Art is not a thing separate and apart — art is only the best way of doing things."
—Elbert Hubbard

To a greater degree than is the case with most mechanical products, motor car design must give consideration to *aesthetics* as well as *utility*. The instinctive desire to move about more rapidly and more conveniently is definitely tied up with the social desire for style, appearance, color, comfort and appointments.

Our stylists point out that in appraising the appearance of a car it is important to distinguish between "Art," "Style," "Fad," "Freak," "Fashion," "Individuality," "Craze," "Novelty."

While many people have difficulty in putting their artistic preferences into words, the typical motorist seems to have very definite convictions as to the dividing line between *freakish* art and *sound* art and during these times he voices a strong leaning toward simplicity in design — reflecting sound and conservative good taste.

Many owners stressed the necessity for giving consideration to the way the car will look after it has had a season of hard service, or "How will it look after it has been driven through the mud and slush?"

Incidentally, this line of reasoning may

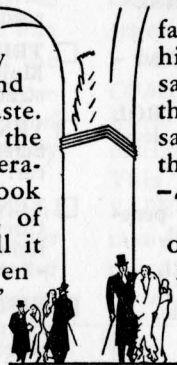
perhaps account for the fact that over 70% of the people voted in favor of the new fender skirts or "valances" which (aside from the fact that they hide the unsightly steering linkage) protect the car from mud and water splashing to an almost unbelievable degree.

As one owner expressed it:

"I choose a car the same as I pick out a suit of clothes — I want one that doesn't look too conspicuously new when I buy it and which won't look shabby and out of date after I've had it a couple of years. It's my feeling that these novelties and 'jim-cracks' in design which make folks 'stop, look and listen' when it's new, will just advertise its obsolescence a year or so later."

This emphasizes the manufacturer's obligation to protect his customers against unnecessary depreciation by avoiding the passing fads and at the same time provide products that embody advanced styling — *artistry of enduring appeal*.*

In other words, this question of appearance has a rather direct relation to economy — *from the standpoint of protecting the future trade-in value.*



*That's why General Motors maintains an ART AND COLOR SECTION comprising some of the world's foremost automobile stylists.

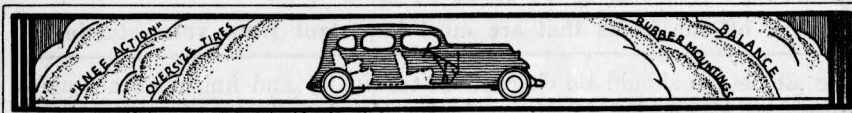
APPEARANCE

☒ Check off the items that are most important from your standpoint

While all details should be checked as to quality and finish, an adequate appraisal of APPEARANCE must be based primarily on what the Stylist would term "*the overall artistic MOTIF — the harmony and consistency of the various elements contributing to the ENSEMBLE.*"

- ☐ **SIDE VIEW**
Consider overall appearance of car — blending of streamlines, also height, windshield slope, fenders, running boards, wheels and rear end treatment.
- ☐ **FRONT END VIEW**
Consider radiator design, head lamps, bumpers, fenders and mud guards — not as separate items but in their relations to one another.
- ☐ **REAR END VIEW**
Consider body contour and blending of body lines with gas tank, fenders, bumpers and tire carrier or trunk.
- ☐ **BODY HARDWARE (Interior and Exterior)**
Should be of high quality — styled in harmony with the overall interior treatment or streamlined in keeping with exterior.
- ☐ **BUMPERS**
Should be designed in keeping with the overall artistic ensemble. Rear bumpers should be of gravel deflecting type to prevent injury to the highly finished body surface.
- ☐ **COLOR**
There should be artistic harmony inside and out. Non-fading.
- ☐ **CRAFTSMANSHIP**
Examine jointing of metal parts — such as running board aprons to body — as to accuracy of fit and quality of finish. Check details of upholstery.
- ☐ **CUSHIONS**
Substantial, well proportioned type with non-sagging springs.
- ☐ **DOORS**
Large, neatly fitted, overlapping type, in harmony with the body lines.
- ☐ **FENDERS AND MUD GUARDS**
Must not only be in harmony with the general motif of the design, but must provide protection against mud and water splashing and prevent gravel striking body. Non-splash fenders also hide unsightly chassis parts.
- ☐ **FINISH**
Should be of high quality and impervious to weather.
- ☐ **HEADLIGHTS**
Should conform with the general scheme of the overall design.
- ☐ **HOOD LOUVERS**
Should conform with the general scheme of the overall design.
- ☐ **INTERIOR**
Consider general artistic motif, including blending of color scheme, quality and appropriateness of trimmings and appointments — overall appearance of instrument panel, dash compartment, etc.
- ☐ **METAL TRIMMINGS**
Used sparingly and appropriately, distributed in harmony with overall design.
- ☐ **RADIO**
Aerial built-in.
- ☐ **RUNNING BOARDS**
Waterproof and in harmony with body contours.
- ☐ **UPHOLSTERY**
High quality, comfortable material — blending with interior design.
- ☐ **WHEELS AND TIRES**
Properly proportioned and in harmony with overall design.

COMFORT AND SMOOTHNESS



"The motorist of today not only wants to travel far and fast but he expects his travel to be comfortable, tireless, and free from worry and nervous fatigue."

Motor cars are bought on the basis of rendering convenient service and rendering it with comfort, and since comfort is so closely related to smoothness, it is convenient to discuss them jointly.

(We are using the word "smoothness" as meaning *the opposite of vibration or roughness.*)

Shocks and vibrations, reaching the passengers, come from two sources:

In addition to a certain amount of vibration which is bound to be present in any piece of machinery, there are also the jolts and bumps of the highway. The railway train, in contrast to the motor car, travels over a carefully constructed steel track which is cushioned on wooden cross ties. *This track is really a part of the railway train mechanism.*

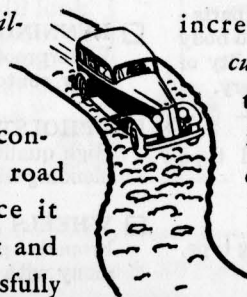
The automobile, on the other hand, must contend with all kinds of road conditions. And since it must be light in weight and at the same time successfully

cope with these conditions, there must be *RESILIENCY* rather than mere *BRUTE STRENGTH*.

During the past four years much engineering skill has been devoted to the reducing and dampening of vibrations through refinements in construction. Thus we have had developments in shock absorbers that have helped to meet the varying conditions of the road and load.

Then we've had some remarkable developments in clashless transmissions, balanced crankshafts and smoother running engines. The Stabilized Front End was another step toward attaining greater smoothness—less stress and strain—through engineering refinement—and there has been an increasing tendency towards

cushioning the vehicle through the use of special mountings made of rubber and other non-metallic substances which deaden vibration instead of exaggerating it.



COMFORT AND SMOOTHNESS



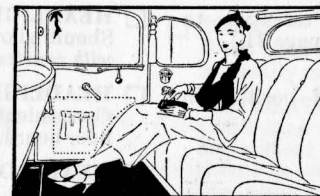
While on this subject of cushioning vibration, it is appropriate to mention steel and wood body construction because, aside from the considerations of greater strength, the use of wood in addition to steel, accomplishes the same sort of vibration-dampening effect as the use of rubber in engine mountings, etc.

* * *

But none of these things really attacked the most serious aspect of the problem at its fundamental source—namely, *the jolts and jars and pitching action transmitted from the irregularities of the highway.*

In other words, shock absorbers, bigger tires and other cushioning devices—although important refinements—could not offset the fundamental shortcomings of the old-style chassis spring construction.

The new independent front wheel mounting and the softer springs and longer spring travel made possible through



this advanced construction might be described as the culmination of the engineering trend toward greater comfort and smoothness. It represents a new approach to the basic problems of chassis layout. It marks a new and important milepost in the history of the industry, setting an entirely new standard for comfort and smoothness.*

Since this remarkable innovation is discussed rather fully over on pages 48 to 53, we won't get into details here except to say that never mind how much you may have read about it, never mind how much you may have heard about it, and regardless of how much you may have been impressed by what you've read and heard—you are going to be astonished the first time you ride in one of these "Knee-Action" cars.

In fact you are going to get a thrill closely approaching your experience the first time you ever rode in an automobile.

**Remember, too, that smoothness contributes to dependability and long life, and as you will note over on page 53, this innovation makes distinct contributions to safety and economy.*

COMFORT AND SMOOTHNESS

☒ Check off the items that are most important from your standpoint

- ☐ **ACCELERATOR**
"Treadle" type restful - gives steady and even control of fuel feed.
- ☐ **ACCURACY OF WORKMANSHIP**
Makes for smoothness.
- ☐ **ADJUSTABLE FRONT SEAT**
"Facilitates relaxation on long trips."
- ☐ **AIR CLEANER**
A clean engine runs more smoothly.
- ☐ **ARM RESTS**
Relieve muscular strain on neck and shoulders.
- ☐ **ASH TRAYS**
Within easy reach and of ample capacity.
- ☐ **ASSIST CORDS**
Make egress more comfortable.
- ☐ **AUTOMATIC MANIFOLD HEAT CONTROL**
Prevents engine coughing and sputtering.
- ☐ **AUTOMATIC SHOCK ABSORBERS**
Even out the irregularities of the highway.
- ☐ **AUTOMATIC SPARK CONTROL**
Instantly adjusts spark to driving conditions.
- ☐ **BALLOON TIRES**
Lower pressure reduces shock.
- ☐ **BODY**
Wood and steel body, insulated with rubber, makes for smooth, quiet, comfortable riding.
- ☐ **BRAKES**
(See SAFETY, page 22.)
- ☐ **CARBURETOR**
Proper fuel mixture essential to smooth operation. (See page 34.)
- ☐ **CLUTCH**
Should be smooth and positive in action.
- ☐ **CONTROLS**
(See page 9.)
- ☐ **COWL VENTILATOR**
Screened to keep out insects.
- ☐ **CRANKSHAFT**
Should be of correct material - adequate weight, balanced, counter-weighted and equipped with harmonic balancer. (See page 46.)
- ☐ **CURTAINS**
Protect rear seat passengers from sun, give added privacy when desired.
- ☐ **DASH INSULATION**
Prevents engine heat from entering front compartment.
- ☐ **DOORS**
Generously wide - easy to open and shut - "mellow-sounding."
- ☐ **DOOR POCKETS AND DASH COMPARTMENT**
Ample size to accommodate maps, parcels, gloves, etc. Dash compartment equipped with lock in strong demand.
- ☐ **ELECTRO-PLATED PISTONS**
Maintain compression, reduce friction and improve performance.
- ☐ **ENGINE**
Number of cylinders. (See page 39.)
- ☐ **ENGINE HEAT CONTROL**
Scientific control of engine temperature necessary for maximum smoothness.
- ☐ **FOOT CONTROLS**
Should be easy to operate.
- ☐ **FOOT REST**
Restful when touring.
- ☐ **FRAME**
Girder type construction for strength and quietness.
- ☐ **GAS TANK**
Of ample capacity.
- ☐ **HARDWARE**
Maximum accessibility, but located so that it will not catch sleeves or hit legs.
- ☐ **HEADLIGHTS**
Should allow ample illumination - but with courtesy!
- ☐ **HEADLIGHT DIMMER CONTROL**
Conveniently located. "Preferably on floor board."
- ☐ **HEAD ROOM AND LEG ROOM**
- ☐ **INDIVIDUAL FRONT WHEEL SUSPENSION ("Knee-Action")**
Newest and most important factor contributing to smooth and comfortable ride. (See pages 48 to 53.)
- ☐ **INSTRUMENT PANEL**
Aviation type, easily seen at a glance.

COMFORT AND SMOOTHNESS

☒ Check off the items that are most important from your standpoint

- ☐ **INTAKE SILENCER**
-for more quiet operation.
- ☐ **INTERIOR SUN VISOR**
-readily adjustable.
- ☐ **KEYS**
Most motorists voted for "fewer keys."
- ☐ **LIGHT SWITCHES**
Convenient to operate.
- ☐ **LUBRICATION**
Greasing points should be few and easy to reach.
- ☐ **LUGGAGE SPACE**
Should be ample.
- ☐ **MANIFOLD CONSTRUCTION**
(See page 34.)
- ☐ **"MENTAL EASE" (See page 8)**
Consider such trifles as: good lifting jack - accessible tire valves - emergency repair kit, etc. Also everything listed under EASE OF CONTROL, SAFETY, and DEPENDABILITY - with special emphasis on NATION WIDE SERVICE!
- ☐ **MUFFLER**
Should provide adequate muffling - with minimum back pressure.
- ☐ **OCTANE SELECTOR**
Smooth operation with any grade of gasoline.
- ☐ **OIL LEVEL GAUGE**
Should be accurate and accessible.
- ☐ **POWER**
Adequate power necessary for smooth performance under all driving conditions. (See page 34.)
- ☐ **RADIATOR DRAIN TAP**
Should be accessible.
- ☐ **RADIO AERIAL**
Already built-in.
- ☐ **REAR VIEW MIRROR**
Should be non-glare type and give maximum visibility to rear.
- ☐ **RIDE STABILIZER**
Eliminates side sway, increases comfort of rear seat passengers.
- ☐ **RUBBER MOUNTINGS**
Generous use of rubber mountings is desirable not only in engine mounting but throughout chassis and body assemblies.
- ☐ **SEATS AND CUSHIONS**
Scientifically designed for maximum comfort - form-fitting and of comfortable, durable material.
- ☐ **SEAT SPRINGS**
Proper resilience important to smooth riding. Motorists voted "soft, resilient springs - heavily padded."
- ☐ **SERVICE FACILITIES**
Conveniently located.
- ☐ **SILENT GEARS**
Quiet gears contribute to comfort and "Mental Ease."
- ☐ **SPRING SHACKLES**
-self-adjusting and self-lubricating.
- ☐ **STABILIZED FRONT END**
Eliminates "weaving" and rattling of entire front end assembly.
- ☐ **STARTER CONTROL**
Conveniently located.
- ☐ **STEERING APPARATUS**
New front wheel suspension provides smooth and shock-proof steering.
- ☐ **STEERING WHEEL**
Large size will not cramp arms and shoulders.
- ☐ **SYNCHRO-MESH TRANSMISSION**
One of the most important mechanical improvements in recent years - provides unequalled smoothness in gear shifting.
- ☐ **"TEMPERAMENT"**
(See EASE OF CONTROL, page 30.)
- ☐ **TIRE COVERS**
Should be equipped with hole or flap through which tire may be inflated without removing cover.
- ☐ **TREAD**
Wide tread essential to smooth riding, especially on unimproved roads.
- ☐ **VENTILATION**
Continuous change of air necessary - but without drafts. Cowl ventilator should be screened to keep out insects. (See pages 54 to 57.)
- ☐ **WHEELBASE**
Adequate wheelbase necessary to comfort.
- ☐ **WINDSHIELD**
Non-glare and safety glass for "MENTAL EASE."

EASE OF CONTROL



Every mile, yes, every minute of driving an automobile requires the operator to make some little decision – and upon these decisions and the expediency with which they are executed frequently depend the safety of the driver and the passengers – as well as the pedestrians and other motorists.

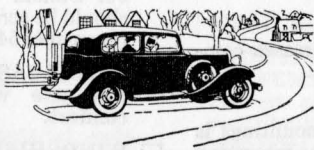
A good driver does things instinctively – there is rarely time to stop and think and reason things out in advance. That's why it's so important that a car shall be easy to control.

Aside from the more or less tangible things that affect *EASE OF CONTROL*, there is what we might call the "*TEMPERAMENT*" of an automobile.

Automobiles are not unlike horses – some horses, although they appear to be perfectly normal and well proportioned, are not worth very much because they don't have the right kind of temperament – *they're hard to handle – have to be watched all the time.*

Some cars seem to almost "*run themselves.*" Others make you feel that you've got to be on the alert all the time you're driving! – that's what we mean by "*TEMPERAMENT*" of a car – but it's hard to describe – *and even harder to analyze!*

EASE OF CONTROL is closely related to Safety, Comfort and Convenience and many of the *tangible* points bearing on Ease



of Control have already been covered under those subjects. We won't repeat them here because we've gotten into quite a lot of repetition already. This can't very well be helped, because, as pointed out on Page 13, the characteristics of the motor car are closely inter-related. It's really impossible to avoid repetition – unless we follow the pattern of the typical automobile catalog, devoting a section exclusively to axles – a section to transmissions – another to the body, and so on – but that's exactly what we're trying to get away from in this particular book – we're trying to take *YOUR* needs and desires and classify the features of design – *not as they are classified in the files of the Engineer*, but from a standpoint of what they contribute to meeting your demands as a *USER* – in other words, a kind of "*cross-index*" to the usual automobile catalog.

You really shouldn't try to read this book right through, but just skip around in it – especially if you find it dull in spots.

Be sure and read page 53

EASE OF CONTROL

☒ Check off the items that are most important from your standpoint

- | | |
|--|---|
| <input type="checkbox"/> ACCELERATOR
Treadle type insures perfect control of fuel feed at all times – especially desirable on rough roads and for long distance driving. | <input type="checkbox"/> INDIVIDUAL FRONT WHEEL SUSPENSION ("Knee-Action")
Contributes greatly to ease of control. (See pages 48-53.) |
| <input type="checkbox"/> ACCURACY OF WORKMANSHIP
– and painstaking assembly contribute to ease of control. | <input type="checkbox"/> INSTRUMENTS
Properly arranged and easily visible. |
| <input type="checkbox"/> ADJUSTABLE FRONT SEAT
Easy and positive control essential. | <input type="checkbox"/> LIGHT SWITCHES
Easily reached and operated. Out of the way of coat sleeves. |
| <input type="checkbox"/> ARM REST
For driver. | <input type="checkbox"/> "MENTAL EASE"
"– the most desirable feature that can be built into a car." (See page 8.) |
| <input type="checkbox"/> AUTOMATIC MANIFOLD HEAT CONTROL
Eliminates sputtering and coughing, allows car to get under way quickly. | <input type="checkbox"/> POWER
Means flexible, effortless operation. |
| <input type="checkbox"/> AUTOMATIC SHOCK ABSORBERS
Help compensate for irregularities in road as well as variations in the load. | <input type="checkbox"/> REAR VIEW MIRROR
Should be non-glare and should provide adequate vision of rear traffic. |
| <input type="checkbox"/> BALLOON TIRES – (Oversize)
Individual front wheel suspension permits use of larger tires, and at the same time provides greater steering ease. | <input type="checkbox"/> STARTING SYSTEM
Investigate new developments – positive, dependable and easy to operate. |
| <input type="checkbox"/> BRAKING SYSTEM
Quick, positive response, with smooth, easy action. | <input type="checkbox"/> STEERING APPARATUS
Should not transmit road shocks. Wheel should "fit the hands." Three-spoke design improves visibility of instruments. |
| <input type="checkbox"/> CARBURETOR
(See page 34.) | <input type="checkbox"/> SUN VISOR
Should be inside and readily adjustable. |
| <input type="checkbox"/> CHASSIS
Should be low slung and properly balanced. | <input type="checkbox"/> "TEMPERAMENT"
(See previous page.) |
| <input type="checkbox"/> CLUTCH
Light pressure. Positive and smooth in action. | <input type="checkbox"/> TRANSMISSION
"Synchro-Mesh" of inestimable value to beginners and expert drivers. |
| <input type="checkbox"/> DOOR LOCKS
Investigate interior push button type. | <input type="checkbox"/> TURNING RADIUS
Short turning radius contributes to ease of control. |
| <input type="checkbox"/> ENGINE
Ample power, flexibility and quick response. | <input type="checkbox"/> VENTILATION
Controls should be handy and easy to operate. |
| <input type="checkbox"/> ENGINE HEAT CONTROL
Automatic control of water temperature. | <input type="checkbox"/> VISION
Narrow front corner posts. Large rear windows. |
| <input type="checkbox"/> FOOT CONTROLS
Easy to reach and operate. Design should definitely reckon with physiology of foot and leg muscles. (See page 9.) | |

LOW LIST PRICE



***"The best is not necessarily the most expensive—
nor is the cheapest always the most economical."***

The fact that people rated *DEPENDABILITY, ECONOMY, COMFORT* and other items ahead of *LOW LIST PRICE* was somewhat surprising and might be misleading.

We went back and studied all the remarks made by people who gave *PRICE* a low rating and their comments might be summarized by saying that "*VALUE*" rather than *LIST PRICE* is the really important thing—and *LIST PRICE* is not always a reliable index of value.

The best definition of *VALUE* that we have been able to think of is that it represents a happy combination of *ALL* the different factors mentioned back on page 13.

From that viewpoint "*VALUE*" becomes the most important consideration of all because it is the net result of all these other things that we're talking about—blended together into a deftly balanced design.

*Right here it's hard to resist the temptation to quote what some of our G. M. owners have told us about the years and years of faithful service rendered by General Motors products, of cars that have been driven 100,000, 150,000 and even beyond 200,000 miles without replacing major working parts. Perhaps at some future date we may issue a book quoting these owner experiences. Such citations, however, would be out of place in this particular book

That's why it's so hard to judge the *TRUE* value of a car.

Even the demonstration doesn't tell the whole story, because a car of the most spectacular performance isn't necessarily the best value over the long pull.*

(Just between ourselves, even the engineers and the research experts can't analyze value in a thoroughly scientific manner except through very elaborate tests combining laboratory technique with practical conditions of usage. That's why General Motors maintains a mammoth Proving Ground with all types of roads and with special scientific apparatus for measuring the comparative value of all makes of cars.)

There are so many intangible and elusive factors that go to make up value that you simply can't put it into words—although one owner (who sent in a 10-page letter criticizing our questionnaire) came pretty close to it when he said:

except perhaps to extend the idea suggested back on page 8, namely, it's hard to evaluate a car through any sales demonstration. The car that had over 200,000 miles to its credit probably didn't show up much more dramatically in the sales demonstration than other products which enjoyed a lesser virility in their declining years. Incidentally this line of reasoning shows why the advice of friends (and quite properly so), exerts such a strong influence on the buyer's choice.

"I go into the Ritz Hotel, I order a Porterhouse steak. I go 3 blocks away into a lunch room and again I order a Porterhouse steak—the specifications are the same—but the steaks are different."

Of course anybody can compare wheelbases and engine dimensions and anybody can check up on the various features of equipment—but these do not reflect the unseen or hidden values that so frequently make one car better than another.

—and aside from the intrinsic value of the product itself, there are other things that contribute *TO* or detract *FROM* its ultimate trade-in value.

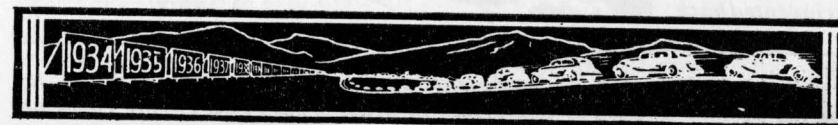
The styling of the car (entirely aside from aesthetic considerations) has a definite bearing on this item of expense. Service facilities and the stability of the local representation are also im-

portant factors to consider—the good reputation of the product among its present owners—the permanency of the manufacturing company—the standing of the dealer representing the product in your community.

The foregoing pages have given many cues—additional points will be brought out in the pages to follow, including some interesting sidelights on how modern research contributes to value and then in the back of the book we will try to give you a tangible basis for analyzing your requirements—for interpreting your needs into terms of the features that from *YOUR* own personal standpoint would represent the greatest value—because value in its true sense depends on *YOU* getting what *YOU* want—for the money *YOU* spend.

We believe that this little book may help you to appraise the intrinsic value of an automobile more or less independently of what the price tag may say—anyway we hope it will—and whether you follow through with the idea introduced back on page 15, or whether you are guided by the suggestion over on page 77, it should be pointed out that

***"The memory of quality remains,
long after the price is forgotten."***



SPEED AND PICK-UP



"Under modern conditions of travel, SPEED and PICK-UP are essential factors of SAFETY."

As previously pointed out, SPEED is of greater importance than its position on the list would indicate. But if the even more important consideration of ECONOMY is to be safeguarded, the desired performance must be attained – not through merely increasing the SIZE of the engine, but through REFINEMENTS IN DESIGN.

Many who gave speed a high rating pointed out that, while they did not drive at high speed, *smoothness of operation was more certain in a car that had a little reserve speed.*

One driver expressed this very aptly when he said:

"I want my car to do only 55 miles an hour –but I want it to do 55 miles an hour NONCHALANTLY!"

Refinements in engine design must be based on a scientific understanding of what goes on inside of a gasoline motor.

This sounds simple but it's NOT simple.

The gas engine was invented back



*in 1860, but it is only in recent years that we are really beginning to understand what goes on down inside of it!**

The designer must understand what we might call "Engine Dietetics" –which involves a knowledge of the chemical structure of the fuel molecules, and how they behave when they are set on fire. The carburetor must feed the engine a properly balanced "diet." The passageways leading to the combustion chambers must be scientifically designed, as to shape and size, so that each cylinder will get an equal share of the fuel. The valves must be of the correct size – the seat-angles –the "lift" –the timing –all these things must be worked out mathematically.

Then there is the extremely important problem of PROPERLY BALANCING the moving parts –which, one might say, is a matter of taking the energy formerly wasted through VIBRATION and making it do useful work!

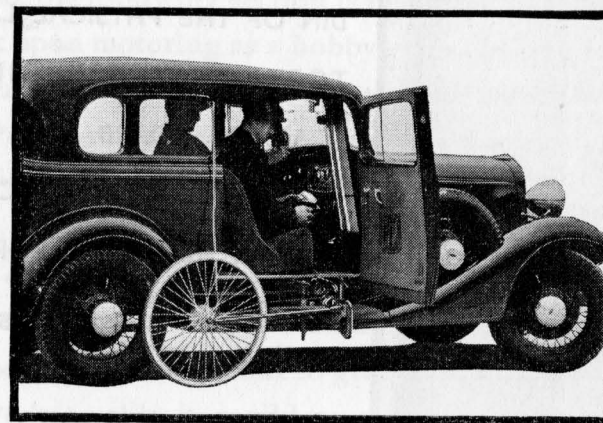
**It would probably be bad advertising to admit this, were it not for General Motors' position of leadership in fields of fuel and engine research.*

SPEED AND PICK-UP

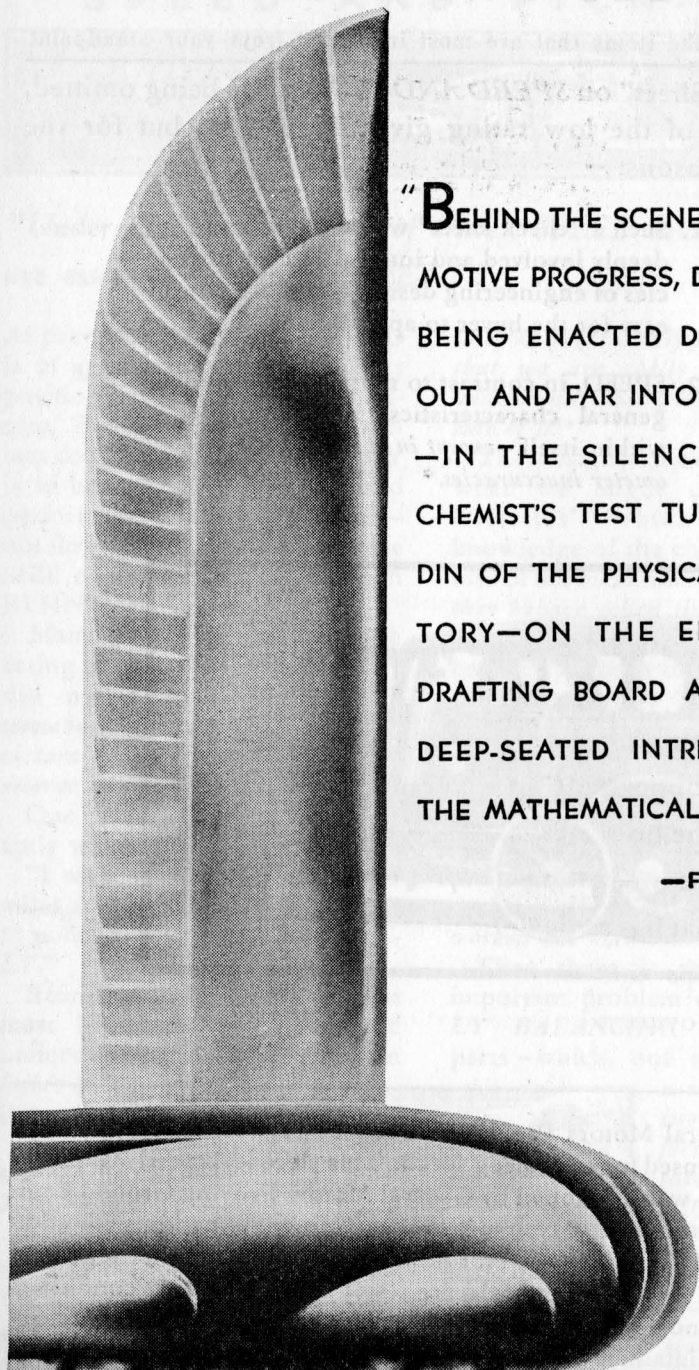
☒ Check off the items that are most important from your standpoint

The "Check Sheet" on *SPEED AND PICK-UP* is being omitted, not because of the low rating given by owners but for the following reasons: –

1. Such a "check sheet" would cover some deeply involved and interrelated intricacies of engineering design which are not easy for the buyer to appraise.
2. SPEED, in contrast to most of the other general characteristics, is measurable within itself –*except in the case of speedometer inaccuracies.**



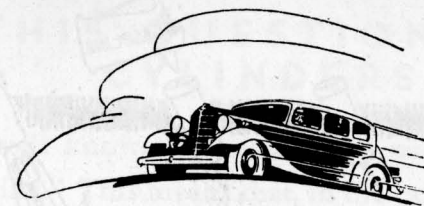
*At the General Motors Proving Ground a "FIFTH WHEEL SPEED-OMETER" is used for measuring speed. This electrical speed measuring device, which was developed by General Motors Proving Ground Engineers, is accurate within 1/10 of 1 per cent! In combination with additional apparatus it is also used for measuring acceleration or "pick-up." Cars from all parts of the world are tested under standard conditions and with standard instruments at this great out-of-doors laboratory which is maintained for the benefit of General Motors Engineers.



NORMAN BEL GEDDES © 1933

"BEHIND THE SCENES OF AUTOMOTIVE PROGRESS, DRAMAS ARE BEING ENACTED DAY IN—DAY OUT AND FAR INTO THE NIGHT—IN THE SILENCE OF THE CHEMIST'S TEST TUBE—IN THE DIN OF THE PHYSICAL LABORATORY—ON THE ENGINEER'S DRAFTING BOARD AND IN THE DEEP-SEATED INTRICACIES OF THE MATHEMATICAL FORMULA!"

—FERRIS NEWTON



THE widespread use of motor cars in this country may have tended to dampen the romance and drama that surrounded the self-propelled vehicle in its early days, but our surveys prove that there are still a goodly number of people who are interested in the motor car, not merely as a modern necessity, but as symbolizing man's conquest over his physical environment from the very dawn of civilization on down to our present day.

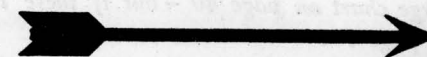
So, the following section is dedicated to those who look upon motoring as a hobby —who belong to what might be called "*the fraternity of motor enthusiasts*."

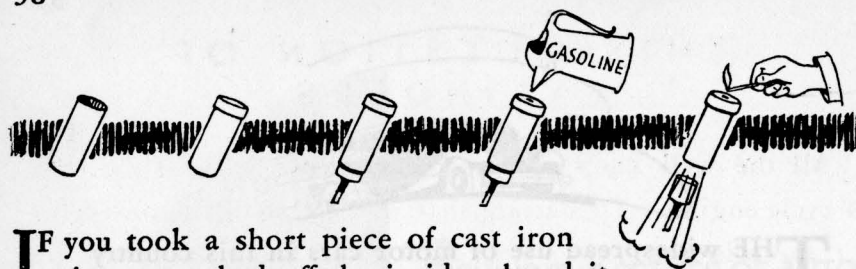
Perhaps it may widen the ranks of that group, especially among the more youthful motorists who did not have the opportunity of watching the interesting evolution of the horseless carriage first hand. Still others may find it interesting to scan through these pages just to see what has to be done to give them what they want.

Perhaps this may add to their appreciation and fuller enjoyment of their next car.

* * * * *

Since in these modern times there is so little literature describing the fundamental workings of the gasoline engine maybe that would be a good starting point as a background for the pages to follow:





If you took a short piece of cast iron pipe, smoothed off the inside, closed it up at one end and fitted a plunger in the other end -you would have something very similar to an automobile cylinder and its piston.

Then, if you could manage to get a little gasoline and air compressed inside of the closed end and set it on fire -the plunger or "piston" would be forced out.

So the cylinder and the piston are really nothing more than a convenient way of transforming the energy of an explosion into mechanical motion.

In an automobile engine the piston is connected to a crankshaft and this changes the *straight up-and-down motion into revolving motion*.

Of course there's a lot more to it than just this:—

We must get the proper portions of gasoline and air mixed into a fine vapor. We must get this inflammable vapor into the cylinder and we must get the burned gases out of the way. This is done with little doors that open and shut -*engineers call them "valves."*

We must open and shut these valves at exactly the right time - and quicker than you or I or any

other human being could do it because it must be done a thousand times a minute or even oftener when you want to ride fast.

So the engine itself is made to open and close its own valves - *that's why we must have a camshaft and some gears to run it.*

We must also have an electrical ignition system to set the gas on fire, and this too must operate at just exactly the right time down to a thousandth of a second.

The engine must run smoothly -if it doesn't run smoothly it will shake itself to pieces in a short time -so a great deal of attention must be given to what the engineer calls "properly balancing the parts." (We'll talk more about that a little further on.)

The engine parts must all be made very accurate and smooth -of proper hardness, or proper toughness, and with adequate provision for lubrication -because the car must not wear out for a long, long time.

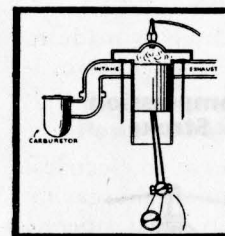
Before reading the opposite page it might be a good idea to glance at the large chart on page 40 - but if these things don't interest you, skip back to page 77.

THIS QUESTION OF CYLINDERS

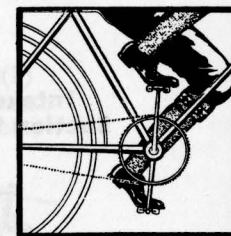
All the well known makes of cars use what is called a "4-cycle engine." This means that, in the case of any one cylinder, there is one power stroke -*and only one power stroke*, for every four times that the piston travels through the cylinder.

In other words, a single cylinder applies power to the crankshaft *only one fourth of the time* -really something less than one fourth of the time because of the "dead center." (See next page.)

An Engine Works Something Like a Bicycle

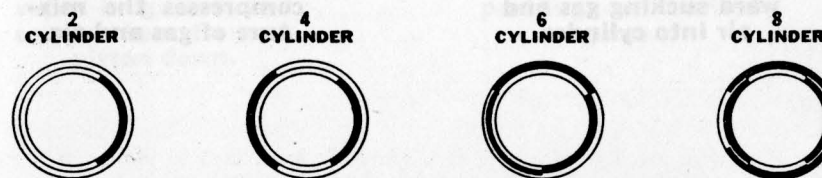


The connecting rod and crankshaft arm correspond to the boy's feet working the pedals. The engine uses gasoline as a fuel. The boy gets his power from such things as spinach, carrots, and oatmeal.



In a 2-cylinder engine, power is being applied less than half the time. In a 4-cylinder there are two power strokes during a revolution but there are *two gaps at which no power is being applied*. With 6 cylinders (and beyond) there is an "overlapping" of the power strokes -in other words power is being applied all the time and this of course adds to smoothness of performance.

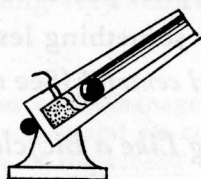
This is shown graphically in the diagrams below:



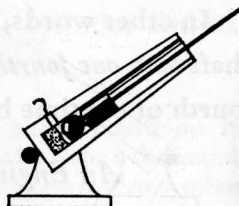
Shaded arcs represent portion of revolution during which power is applied.

THE "4-CYCLE" ENGINE WORKS SOMETHING LIKE A CANNON

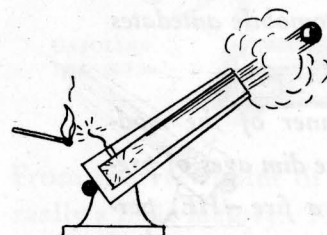
(1)
LOADING



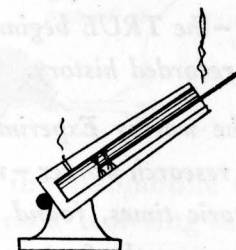
(2)
RAMMING



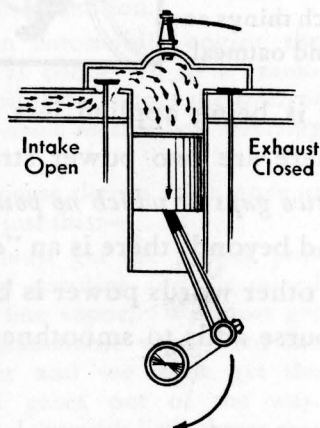
(3)
FIRING



(4)
CLEANING

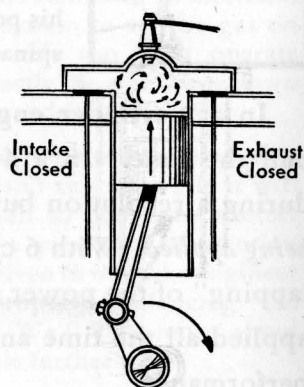


(1)
**Intake or
Suction Stroke**



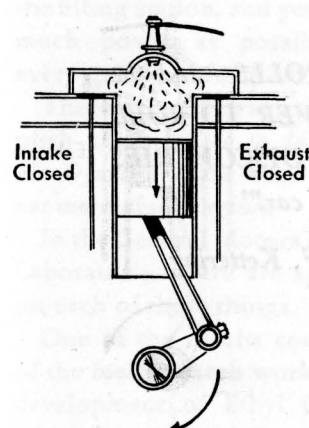
Piston moves downward sucking gas and air into cylinder.

(2)
**Compression
Stroke**



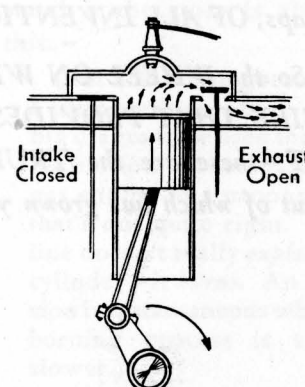
Piston pushes up and compresses the mixture of gas and air.

(3)
**Explosion or
Power Stroke**



The compressed vapor is ignited, and explosion forces piston down.

(4)
**Exhaust
Stroke**



Piston moves back up pushing out burned gases.

NOTE: Enlarged copies of this chart, for use in classroom work, will be supplied to schools and colleges upon application.

THE Motor Car is not the invention of any one man—but a composite aggregation of many inventions. Although scarcely more than a generation old—the TRUE beginning of the automobile antedates all recorded history.

"The worthy Experimenter—forerunner of the modern research worker—who, back in the dim ages of pre-historic times, found how to build a fire—HE, perhaps, was the first to contribute a discovery to the car of today.

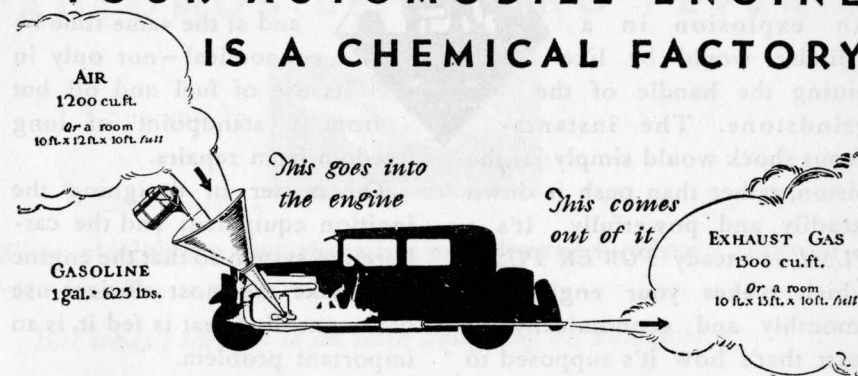
"Industrial history—in fact CIVILIZATION itself, dates back to the first wheel—the GREATEST, perhaps, OF ALL INVENTIONS!

"So the WHEEL ON WHICH IT ROLLS—and the FIRE THAT PROVIDES THE POWER TO ROLL IT—these are the TRULY BASIC DISCOVERIES out of which has grown your modern car!"

Charles F. Kettering



YOUR AUTOMOBILE ENGINE IS A CHEMICAL FACTORY



From the viewpoint of the chemist, the automobile engine is really a little factory. The "raw materials" entering this factory are gasoline and air—the "finished products" consist chiefly of water, carbon dioxide, and carbon monoxide. From a chemical standpoint one might say that power is produced *as a by-product*. It is this "by-product," however, for which you pay your money at the filling station, and you want as much power as possible from every gallon of fuel that you buy.

There are two ways to accomplish this—one is to learn more about fuels and the other is to find out more about engines.

In the General Motors Research Laboratories there are specialists on each of these things.

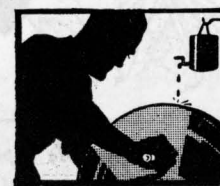
One of the results coming out of the fuel research work was the development of Ethyl Gasoline, which has successfully eliminated engine knock and made possible the building of more powerful and more efficient engines.

We, of the Customer Research Staff, have had a lot of conversations with General Motors Research Engineers re-

garding Ethyl Gasoline and as near as we are able to understand it the story is about like this:—

(But first we've got to make a little apology—back on the big diagram we used the word "explosion" in comparing the gas engine to a cannon—and that's not quite right. Gasoline doesn't really *explode* in a cylinder—it *burns*. An explosion is instantaneous while the burning process is a *trifle* slower.)

When you turn a heavy grindstone you don't run up and *hit* the handle; everyone knows that if you did that you'd waste a lot of energy and not get much work done. What you really do is to *lean against the handle and exert your strength and weight to turn it*.



An explosion in a cylinder would be like hitting the handle of the grindstone. The instantaneous shock would simply jar the piston, rather than push it down steadily and powerfully. It's a **PUSH**—a steady **POWER PUSH**, which makes your engine run smoothly and economically—at least that's how it's supposed to work, but if your engine gets full of carbon you are likely to have an instantaneous burning instead of an orderly burning because the accumulation of carbon takes up space and this increases the compression beyond what the designer intended. So when the spark occurs in a *carbonized engine*, the fuel all but explodes. It goes off with a **BANG!**—just like flashlight powder.*

What Ethyl does is to prevent explosive burning and allow the fuel to develop its full power at the proper time, regardless of the carbon.

★ ★ ★

The foregoing gives you some idea of General Motors Research in connection with fuels—but of course there are many other things that must be studied in order to make sure that the engine in your car will give maximum performance



and at the same time be economical—not only in its use of fuel and oil but from a standpoint of long freedom from repairs.

The matter of designing the ignition equipment and the carburetion system so that the engine will make the most efficient use of the gasoline that is fed it, is an important problem.

The woodman in laying a fire takes pains to arrange the sticks so that air can get all in between them. Then in lighting his fire he is very careful to apply the match at exactly the right place to be sure of starting a good blaze. He considers the direction of the wind, etc.

Designing the carburetion system and the ignition system of an automobile engine present the same kind of problems. Gasoline does not burn efficiently unless the right proportions of air are mixed in between the tiny particles of gas.

The size and shape of the combustion chamber are of utmost importance. The spark plug must be located in exactly the best position in the combustion chamber—**THE PROPER PLACE TO TOUCH THE MATCH, SO TO SPEAK!**

*As a matter of fact, if you compress inflammable vapor hard enough it will explode without electrical ignition. (Diesel engines work on that principle.)

"AUTOMOBILE SPRING FEVER"



When clothes are wet, the wind will dry them; when a room is full of smoke, a draft will clear the air.

But what's this got to do with designing an automobile?

Very little within itself except that it was through the recognition of this practical, everyday principle that led to an improvement that has added tremendously to the durability of engine parts, not to mention economy in oil consumption.

An engine is hard to crank in cold weather. When it is cranked again and again, especially when the cylinder walls are cold, a small amount of water condenses and trickles down into the crankcase. This water comes from the burning of the fuel and air in the engine—as amazing as it may seem, almost a gallon of water for every gallon of fuel. Most of it, of course, goes out through the exhaust.

As we have already seen, fuel mixes with air and is burned in the cylinders. Since gasoline always contains a certain amount of sulphur, the sulphur burns also and then, in the form of an oxide, it dissolves in the water and forms sulphuric acid.

Now, as everyone knows, sulphuric acid is a very strong acid and even when diluted with water it eats right into such things as steel and iron. So, unless it can

be removed, it will accumulate in the engine all during the winter and seriously damage the finely-machined working parts.

This trouble was very common in the cars of a few years ago and its causes were not known. Everyone took it as a matter of course, but when it became more pronounced as a result of cars being used more generally in winter, General Motors chemists and research engineers began to conduct experiments which led to a better understanding of the trouble.

After they discovered that the so-called "excessive wear" which caused the common complaint of "spring fever" in motor cars, they next set about to find a solution.

They reasoned that since they couldn't stop the acid from forming, they would have to do something to keep it from coming into contact with the metal parts of the engine.

So in line with the old time principle, little windows were put in the sides of the crankcase so that the vapors of burning sulphur and water could be disposed of—before they could do any harm.



"THE MATHEMATICIAN'S PARADISE"

Before the automobile came along, gears, or what we used to call "cog-wheels" had the habit of making a lot of agonizing noises, especially when running fast. Even in automobiles, up to just a few years ago, you were frequently conscious of grinding, howling and clashing sounds coming from the gears.



Now, if an engineer were writing this book, he could hardly resist the temptation to devote at least ten or fifteen pages to the designing of a "gear tooth."

Designing the shape of a "gear tooth" for a modern automobile presents some extremely intricate mathematical problems. It has been aptly said that the modern automobile gear is "*The Mathematician's Paradise*."

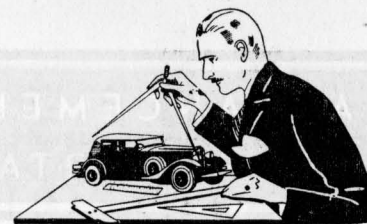
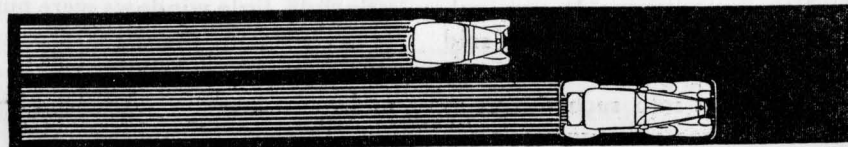
There are scientists who have spent their whole lives just working out ways to make gears run smoothly and quietly and it's an awfully important matter too, because wherever there's noise and clatter there's bound to be inefficiency and short life—all engineers agree on this point.

Few mechanical parts look so simple when they are all finished

and yet involve so much detailed study as a gear tooth. The gear designer has to get into all kinds of theoretical calculations. He has to be on intimate terms with such high-sounding things as the "involute" curve, the "cycloidal" curve, the "epicycloidal" curve and even the "hypo-cycloidal" curve.

—and the designing of a perfectly balanced crankshaft is even more intricate.

The crankshaft in an automobile engine rotates in much the same way that a top spins. Now, we all know that a good top will spin smoothly if it's well balanced, but *hit it with a hammer, break a sliver out of one side, or injure it in any way and then it*



begins to wobble, because it has lost its balance. Of course, a top is shaped very simply. You can almost look at it and tell whether it will spin smoothly or not, so the top manufacturer probably doesn't have to get into any theoretical calculations to make his tops properly balanced.

But a crankshaft, in contrast to a top, is an awkwardly shaped proposition to say the least—and in addition to its own odd shape, it has all kinds of things hooked onto it, such as clutches, flywheels, connecting rods—and pistons pounding away at it all the time.

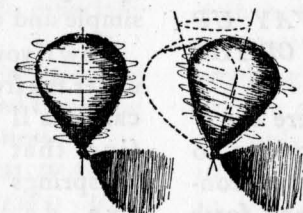
Yet, if your engine is to run smoothly the crankshaft must

spin around just as smoothly as a good top. It is sure to wobble if it is the least bit lopsided. Such wobbling will not only wear out your automobile but will make your motoring tiring as well as expensive.

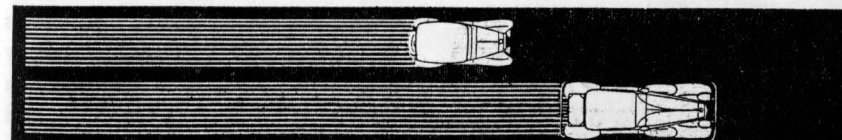
Of course you are not interested in the mathematical aspects of design, but you *are* interested in **DEPENDABILITY, ECONOMY, COMFORT** and **SMOOTH-**

NESS—these characteristics on which motorists have cast such a heavy ballot. And these are all definitely dependent on the proper balancing of crank-

shafts, pistons, connecting rods, etc.



So in passing we thought that this matter of crankshaft design should at least be mentioned as one of the *unsung achievements of the modern research engineer!*



TO THE ADVANCEMENT OF MOTOR TRANSPORTATION

It seems that ever since the time when somebody first took a gas engine and stuck it in an old-fashioned buggy – automobiles have had the habit of RIDING HARD IN THE BACK SEAT.

Everybody knows this –but it's not generally known that the pitching and jolting of the back seat passengers was not the fault of the back seat at all –nor of the rear springs, **BUT WAS DUE TO A BAD SITUATION WAY UP AT THE FRONT END OF THE CAR.**

The front springs were *out of harmony* with the rear springs, so the front and rear ends were continually fighting back and forth at one another –just like two musical instruments that are played in discordant keys –which, incidentally, is more than just a figure of speech because in both cases it's a question of WAVES, or what the engineers call "periodicity" and "oscillation."

IN PLAIN EVERY-DAY LANGUAGE, THE FRONT SPRINGS WERE TOO STIFF OR

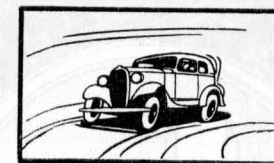
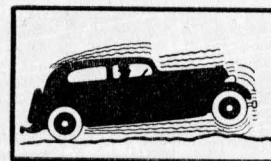
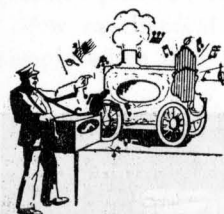
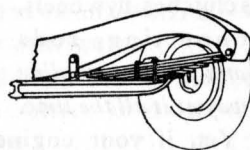


"HARD" IN COMPARISON WITH THE REAR SPRINGS.

The obvious remedy was to make the front springs softer so they would work in harmony with the rear springs –but this was not so simple and easy as it sounds.

Now if you'll get down and peep under the front end of an old-style car you'll find that the springs are depended-upon to hold the front axle in place. A bump under one wheel will raise the axle and tilt the other wheel –and perhaps you know from your own experience (or from the experience of others) that if you **BREAK** a front spring the whole steering mechanism is thrown out of commission.

In other words, under the old-style construction the front springs **HAD TO DO TWO JOBS** –they not only had to serve as springs but they had to keep the front end



running gear in proper alignment.

These two jobs didn't mix very well because if you made the front springs **STIFF ENOUGH** from a structural standpoint they'd be **TOO STIFF** for riding comfort –or on the other hand, if you made them **SOFT ENOUGH** to match up with the rear springs they'd be entirely **TOO SOFT** to give the proper stability and your car would wobble around on the road and be very unsafe, especially when turning corners.

So we see that the old-fashioned system of springing the front end was a compromise at best.

THE BIG PROBLEM WAS TO DIVORCE THESE TWO JOBS FROM ONE ANOTHER AND DEAL WITH THEM SEPARATELY.

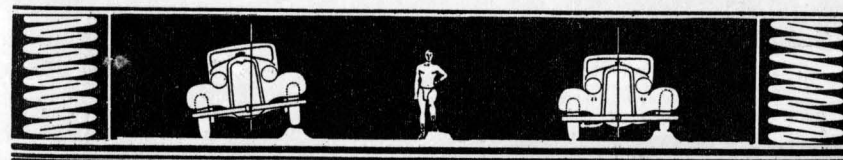
Sounds simple enough – but it is one of the most complex problems that has ever been solved by the automobile designer.

It wasn't just a matter of sticking in a coil spring and a couple

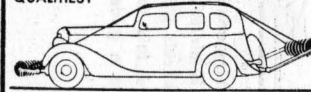
of brackets. It must be remembered that automobiles have been pretty satisfactory in the past –and all of the chassis engineering was definitely tied in with the tradition of a flat, stiff front spring construction.

To change one thing you had to change other things. In other words, to be basically sound, the new front springs could not be tacked on just as an accessory or a "gadget." And since you want to gain the full advantages of the new construction without sacrificing anything else –you have to measure the effect of these changes –not only within themselves –but in their relation to one another –in fact you have to take what amounts to a *new and different approach* to the *overall problems of chassis design* –which illustrates the difference between the sound, scientific approach and the "*hit or miss*" method.

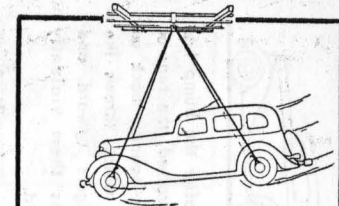
Some of the General Motors engineers have been devoting their entire time to a study of this



WHAT KIND OF WEIGHT DISTRIBUTION WILL GIVE THE BEST RIDING AND DRIVING QUALITIES?



Through this simple device various combinations of mass distribution and springing could be tested under actual driving conditions.



To get first-hand data on mass distribution a car weighing over 3 tons was swung from the roof girders as a gigantic pendulum.

problem since 1930, conducting tests and making studies and computations of such high-sounding things as "periodicity", "oscillation", "harmonics" and "moment of inertia."

If you could see all the sketches, diagrams and charts that were worked out incident to the preliminary researches you might easily **MISTAKE THEM FOR DR. EINSTEIN'S ORIGINAL WORKING PAPERS!**

Now, of course no one but an engineer would be able to understand the mathematics of the thing—but you don't have to understand the engineering theories in order to appreciate what it means in terms of riding comfort and relaxation in motoring.

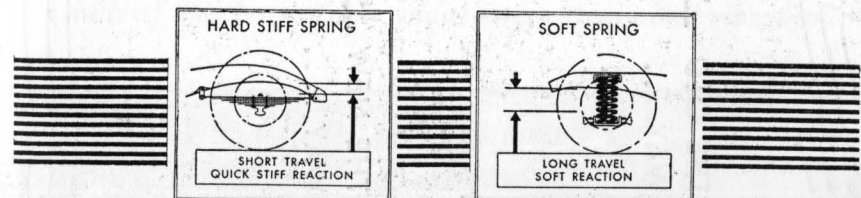
The charts on the next page will give you some idea as to how

these new cars behave when encountering irregularities in the road.

With the wheels held in alignment *independently of the springs*, we can make the springs just as soft as we want them. And with the new coil spring construction it's possible to get a **LONGER SPRING TRAVEL** than with the old-style construction.

The car naturally rides smoother **UNDER ALL CONDITIONS** because of the softer springs and the longer spring action. When you strike a ridge in the road—such as a car track, a railroad crossing or a culvert—the softer front springs absorb the shocks instead of transmitting them to the rear of the car.—and since each front wheel is independently sprung, you can hit

But maybe you're not interested in all this and would like to skip to page 52

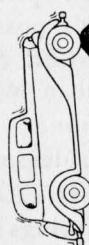


—fragments reproduced from the "log-book" of a General Motors Division Engineer, who since May 1930, has been devoting his entire efforts to the problems discussed in this section.

THE OLD WAY...



1. The shortcomings of the old type stiff front springs and rigid axle are not so apparent when the road is exceedingly smooth and level, — a condition one rarely finds.



2. —but when a bump is encountered the stiff front springs lift the front of the car, pitching the body and causing the rear springs to compress unduly.



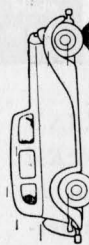
3. —and when the rear wheels strike the bump the rear springs are compressed even further.



4. Then after the bump has been crossed, the rear of the car bounces back up again which throws the passengers upward and pitches them violently forward.



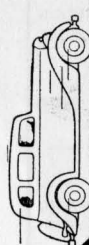
1. Even on good roads the softer front springs made possible through knee-joint construction, make the car ride more smoothly, the soft springs absorbing the small road shocks found on even the best roads.



2. When a bump is encountered, by either wheel or both wheels, the soft springs give way to the bump without lifting the front end, leaving the body practically level.



3. The car is still practically level when the rear wheels reach the bump, thus avoiding excessive compression of the rear springs.



4. So the pitching and jolting of the car is minimized, as the rear wheels cross the bump, and this changes our ride to a glide.

THE NEW WAY....



a bump with one wheel without disturbing the other wheel — hence the name “*KNEE-ACTION*.” —and incidentally —but quite importantly —a more scientific distribution of mass between front and rear wheels has been attained. Your car is more stable —like a well ballasted ship —and this adds further to comfort.

It's really amazing what this new type of construction has accomplished. For example, you'll find it unnecessary to brace your feet and catch hold of a door handle when riding on rough roads. You'll not be jostled around against the other passengers, you won't be thrown violently forward in the seats. *The bumps on the highway seem to level themselves out just as you reach them!* Never mind about road conditions or whether you sit in front or rear, you are relieved from the pitching and jolting, the ride has been

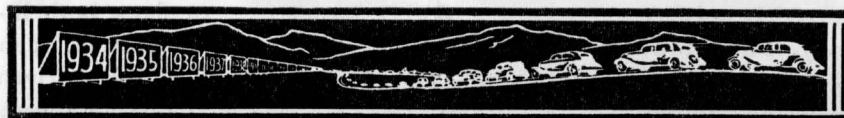
changed to a glide —with a sensation that is closely akin to floating, so you reach your destination almost as fresh as when you started.

But don't waste too much time on these pictures and explanations because to really appreciate what it means you've got to go out and actually ride in the car —it's simply not the type of thing that can be explained in a book.

A ride in the car is more convincing than anything we can write —but even that is not going to tell the whole story because this innovation really *can't be classified as just a feature of comfort.*

Smoother riding makes smoother, *easier steering.* Road shocks can no longer get through to the steering wheel —and a greatly improved steering linkage is made possible through the new construction. The danger of accident from blow-outs is minimized. Your car is decidedly *SAFER.*

—and this new construction is destined to have a telling effect on ECONOMY by slowing down the rate of depreciation and reducing repair bills because it protects the vital units of the chassis from undue stress, strain and vibration.



TO THE ADVANCEMENT OF MORE HEALTHFUL MOTORING

One of the most important functions of an automobile is to contribute to **HEALTH** –and bad ventilation –so characteristic of every car prior to the development of scientific No Draft Ventilation –was really a menace to healthful outings.



Without this innovation you either get too much air or else not enough air –and when you *do* get enough air –you can't get it where you want it –all of the air that goes into the car seems to pound into the back of your neck, which is exactly where you don't want it –*especially if you are a sinus sufferer or if you are susceptible to colds or neuritis.*

Higher speeds and winter driving have made this problem more acute each year.

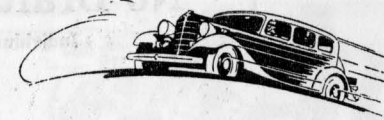
The closed car came into being over 20 years ago but since that time, up until 1933, very little had been done to improve ventilation. Of course cars didn't run very fast back in the early days and most any kind of ventilating system was fairly satisfactory. Then, too, there were so many other things



demanding the attention of the engineers that very little thought was given to ventilation in its scientific aspects. So, year after year, things went along without much change *and all the while cars were being run at higher and higher speeds.*

Then the engineers of the Fisher Body Corporation began some basic studies of air currents, vacuums, etc., as bearing on the design of automobile bodies and it was these studies that led to the invention of the Fisher No Draft Ventilation.

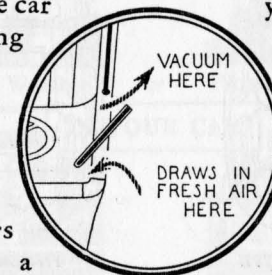
They conducted many tests incident to the development of this important innovation. These tests were very interesting and some of them were surprisingly simple. For example: Various types of cars were bedecked with little ribbons or flags, both inside and out. Then they were driven at varying speeds



–with the ordinary windows and ventilators adjusted to different positions. By watching these ribbons it could be seen at a glance just what kind of air currents were being created when the car moved along at varying speeds.

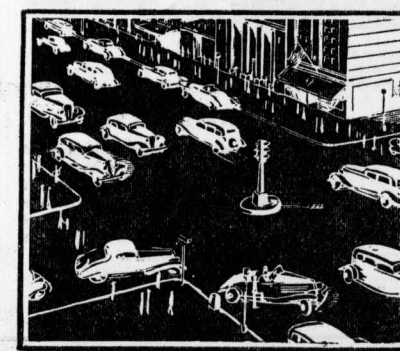
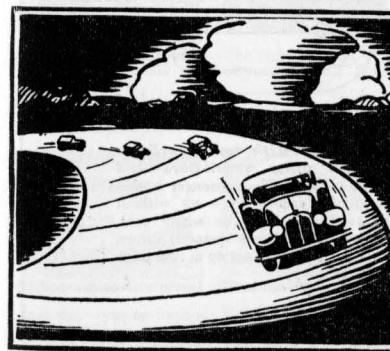
After learning how the air currents behaved around a car running at various speeds, Fisher Engineers set about to develop a method of getting the air in and **OUT OF THE CAR** just *where* it was wanted and *when* it was wanted.

The diagram shows how it works and the pictures on the next page show how this revolutionary improvement eliminates drafts and for the first time in the history of the automobile provides the motorist with scientific ventilation and at the same time protects both him and his passengers from exposure, bad air, and drafts.



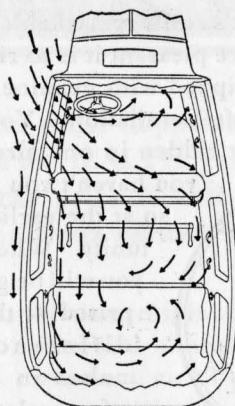
It's really remarkable how much more pleasant it is to ride in a car equipped with genuine Fisher No Draft Ventilation. You've probably ridden in one already but if you haven't you should do so at the earliest opportunity. When you do, you will be greatly surprised at the marked difference that it makes in motoring comfort, relaxation and protection –especially in cold weather or between seasons when motorists are likely to contract head colds.

Right at this point we can't help reminding you that the Fisher Organization also pioneered the closed body –and it looks as though No Draft Ventilation –their new contribution to the advancement of motor transportation is destined to go down in the history of the industry as ranking along with the closed body.



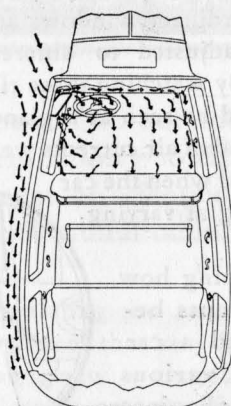
No Draft Ventilation

Individually Controlled



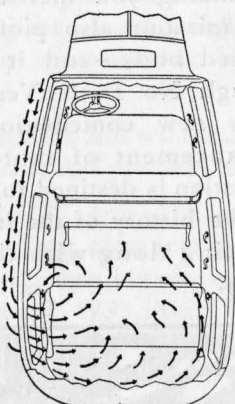
CONVENTIONAL TYPE

Conventional type car with driver's window open. Arrows show how air rushes past the driver and swirls around the necks and shoulders of passengers in the rear seat. Fisher No Draft Ventilation ends this annoyance and discomfort.



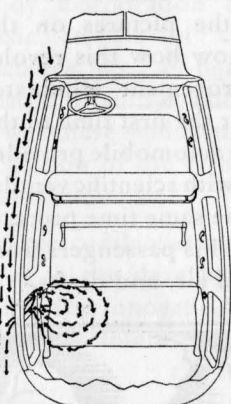
FISHER NO DRAFT

Fisher body with driver's window down, ventilator open. Arrows show how air now flows across windshield, preventing clouding in stormy weather. Air is diffused gently throughout the car without annoying drafts.



CONVENTIONAL TYPE

Conventional type car with rear window open. Arrows show how drafts swirl across the whole width of the rear seat. While the passenger beside the window may be quite comfortable, his seat mate may be shivering with a chilly breeze around neck and shoulders.



FISHER NO DRAFT

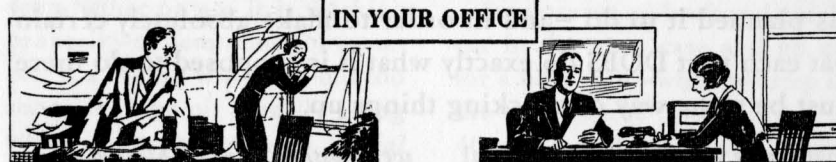
Fisher body with rear ventilator open. All other ventilators and windows closed. The passenger beside the ventilator enjoys fresh air without drafts swirling across the whole seat. Smoke and used air are instantly drawn outside by the vacuum set up at rear edge of ventilator.



Uncontrolled, Drafty Ventilation

or

Adequate Fresh Air Without Drafts



Stuffy Air During Stormy Weather

or

Proper Circulation of Air at all Times



Drafty Ventilation—Not Enough for One—Too Much for Others

or

No Draft Ventilation—Exactly Right for Everybody in Car



Plenty of air—but a draft on the back of your neck



As much fresh air as you want without drafts.



Storm—either fresh air with rain entering in or stuffy air with clouded windows.



Plenty of fresh air and no rain entering the car.



Passengers in back seat complaining of cold air



The right amount of air circulation for Everybody.



Smoke and ashes blowing back. Women's hair in disorder from wind.



Smoke and ashes quickly expelled. Women's hair unruffled—no draft.



Hot day—engine heat—dust—insects come in through open windows.



Hot day—a regular hurricane of cool air without engine heat, dirt or insects.



Storm—stuffy inside of car, windows and windshield frosted.



Storm—Air without rain entering car—circulation prevents frost on glass.

"THE BLINKING MACHINE"

If an automobile is going to run smoothly and last a long time, then every little part in it has got to do exactly what its designer has planned it to do –and in order to make absolutely certain that each part DOES do exactly what it is supposed to do there must be some way of checking things up.

That's why we have to have special instruments and testing devices.

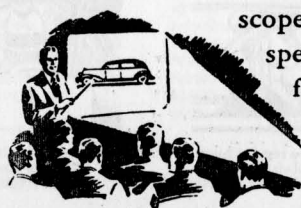
In checking up a highly refined mechanism such as the modern automobile we can't rely too much on the human senses of sight, feeling and hearing –*they are too variable and too inaccurate for scientific work.*

Some of our Research Engineers devote most of their time to working out special instruments that will make up for the deficiencies of the human senses.

In the General Motors Laboratories and at the Proving Ground there are literally hundreds of special instruments of various kinds and descriptions, and new ones being developed all the time. Some of them you can see how they work just by looking at them but others are so uncanny that one would almost think they had been pulled out of a magician's trick bag!

For example, let's take the "Blinking Machine":

When a wheel spins the spokes become a blur. But if it



were possible for you to blink your eyes every time the wheel revolves the spokes would again become visible.

In fact, the wheel would appear to stand still. Of course, one can't blink that fast, especially with a wheel turning a thousand revolutions a minute or more. But electricity works much faster than the human eye, and so electricity has been put to work to do this blinking for us.

Our research engineers want to study various parts of the automobile –such things as engine parts, and they want to study them, not while the engine is standing still but while it's actually in motion, so a special kind of blinking electric light has been developed that can be adjusted to blink at the same rate that the part is revolving. They call this the "stroboscope."

If the blinking of the stroboscope is timed at the same speed as, for instance, the fan on the engine, then the fan appears to be standing still instead of running.

The stroboscope is used to study the motions of such things as valve springs and the flow of oil in a crankcase. Having made an object running at a high speed appear to stand still, it's easy to see whether or not it is working properly –to determine, for example, if a spring will wear out too soon, or if the oil is really going where it is supposed to go. *Special engines with glass windows in them are built up for such tests.*

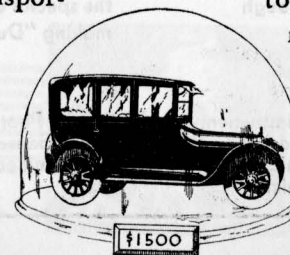
By throwing the timing of the flashes just a little "out of tune" the object may be made to look as though it is moving very slowly –in either a forward or a backward direction.

Incidentally, our engineers tell us that it is this same principle that sometimes makes the wheels of an automobile in a moving picture appear to turn backwards. Of course, in that case it happens accidentally, whereas in the laboratories our engineers have made this same kind of "accident" serve a useful purpose.

* * *

And so we might go on and on into the fascinating intricacies of modern research which has contributed so much to the advancement of motor transportation.

Back in the General Motors Laboratory and at the General Motors Proving Ground, and in the



Division Engineering Departments, highly skilled technicians are devoting their lives to the unravelling of these problems to the end that your car shall give you the utmost in satisfaction.

Suppose we go back and get the car in the glass case and go out for a little ride –when we step on the throttle and "open it up" to 40 miles an hour it will vibrate like the proverbial "bowl full of jelly," whereas the well engineered car of today can be driven at 60, 70 or even 80 miles an hour *with practically no vibration!* It is more reliable –it is more economical –it is better looking –it is smoother and more comfortable –it is safer –it is easier to handle –it is more dependable under all conditions and will last longer.

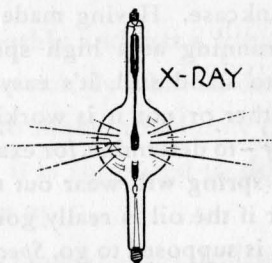
These achievements have come about not so much through inventive genius, or dramatic discoveries, but through painstaking studies constantly going on behind the scenes, involving the deepest mathematical analysis of motions, forces, stresses, strength of materials, chemical reactions –not only from a scientific standpoint –not alone from a practical production standpoint –but in their relation to the everyday requirements of the practical motorist as disclosed through Customer Research –*the third link in General Motors Fact Finding.*

FROM ALL FIELDS OF SCIENCE



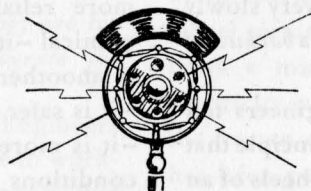
THE ULTRA VIOLET LAMP

Provides Concentrated Sunshine for testing paints, lacquers, etc.



THE X-RAY

Used to detect flaws inside iron castings.



THE MICROPHONE

Used in special instruments designed for measuring noises in gears, bodies, etc.



PHOTO-ELECTRIC CELL
(First cousin to radio tube)

Used to magnify things that can't be measured through ordinary methods.*



BACILLUS
AUTOBUTYLICUM

This little yeast germ provides the special alcohol required in making "Duco" finish.

*Through the use of delicate instruments employing the Photo-Electric Cell, magnifications as high as 1,000,000 to 1 are not uncommon in General Motors Laboratories. The edge of the paper on which this is printed, if magnified to that degree, would appear to be over 200 feet thick!

"THE HOUSE THAT JACK BUILT"

Within the modern motor car, more than in any other product, we find a reflection of practically all the sciences, crafts and applied arts including *mathematics, physics, chemistry, metallurgy, electricity, mechanics, ceramics* and so on.

-and if we attempted to name the materials that go into a car -plus all the things that are used in producing it -the list would run into many pages, *even though printed very small!*

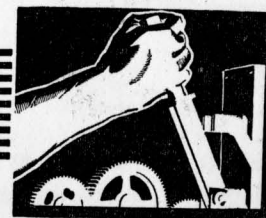
That's why the automobile industry plays such an important part in our economic structure.

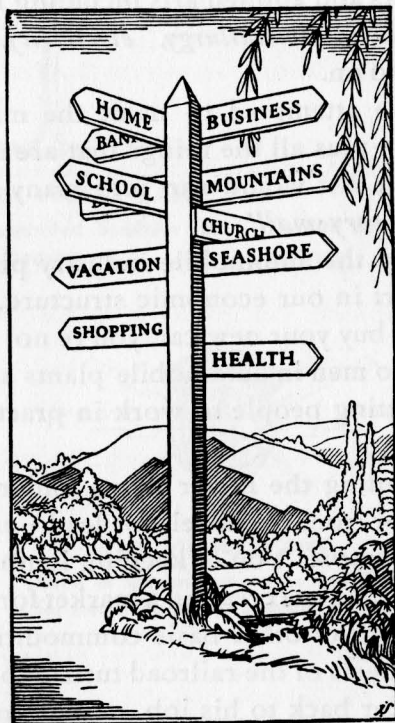
When you buy your new car, you're not only giving employment to men in automobile plants and garages, but you're putting people to work in practically every line of industry.

You're sending the miner down under ground to dig copper -or iron, or nickel -or lead -*and he begins earning wages again.* You're keeping lumbermen busy in the forests. You are creating a market for cotton and wool and dozens of other basic commodities. You're making the wheels of the railroad turn. You're calling the steel worker back to his job -and doing the same for people who work in glass factories -tanneries -foundries -chemical works.

There's really nothing you can buy which so quickly brings work and wages to so many people -in so many places -as buying a new car.

-well, it's like "THE HOUSE THAT JACK BUILT".





"The modern motor car has become intimately woven into our social and economic fabric. It has enriched the lives of our people. It has transformed a Nation into a Neighborhood."

—BRUCE BARTON

PLANNING IN ADVANCE

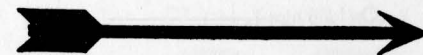


It is the practice of well managed business institutions to plan their purchases well in advance of the time that they actually go out into the market to buy, and our customer surveys indicate that *most automobile buyers are inclined to follow the same practice.*

So, as a part of our Automobile Buyer's Guide we are including the following "*check sheets*," which we hope may prove helpful in enabling you to more definitely analyze *your* personal transportation problems — *in advance of the time that you set about to choose your new car.*

By filling out these forms before you even *start* to shop for your new car, you will be able to crystallize your needs, tastes and desires in a systematic way and this, we believe, should prove helpful in guiding your choice *with the assurance that you are selecting, from among the many cars on the market, the one specific make and model that will come the nearest to meeting your all around needs for the years to come.*

{ The "CHECK SHEETS" on the following pages are provided for your personal use. They are not to be returned to us. }



—or perhaps you may find the suggestion on page 77 more appealing, and less time-consuming.



"PLANNING FOR MY NEW CAR"

"MY PRESENT CAR"

Make _____

Year of manufacture _____

Body style of my present car—

☐ Roadster

☐ Phaeton

☐ Coach

☐ Coupe

☐ Sedan



☐ Roadster

☐ Phaeton

☐ Coach

☐ Coupe

☐ Sedan

Body style desired on next car.

Number of people in family _____

Number who drive _____

Regularly _____

Occasionally _____

Not at all _____



The size of my present car is—

☐ Too big

☐ Too small

☐ Just right

Which one will do most of the driving? _____

Most of our driving will be—

☐ In city traffic



☐ On country roads



Number of passengers usually carried—

On long trips _____

On short trips _____

My annual mileage is _____

Don't rely on memory. Plan your purchase in advance.

I expect to keep my next car—

☐ One Year

☐ Two Years

☐ Three Years

☐ Four Years

☐ Five Years

—before trading it in.

Characteristics most desired in our new car

FAMILY BALLOT

Have each member check (✓) characteristics that they consider most important.

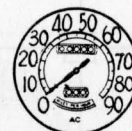


(use one column for each member of family)

	No. 1	No. 2	No. 3	No. 4	No. 5
APPEARANCE					
COMFORT					
DEPENDABILITY					
EASE OF CONTROL					
LOW LIST PRICE					
OPERATING ECONOMY					
SAFETY					
SMOOTHNESS					
SPEED AND PICK-UP					

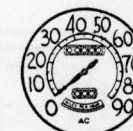
Normally I like to drive at about this speed—

Indicate with ✓



This is about the fastest that I ever want to drive—

Indicate with ✓



Type of ENGINE in my present car—

☐ 4 cyl.

☐ 6 cyl.

☐ 8 cyl.

☐ 12 cyl.

☐ 16 cyl.



☐ 4 cyl.

☐ 6 cyl.

☐ 8 cyl.

☐ 12 cyl.

☐ 16 cyl.

Type of ENGINE preferred in my next car—

NEW CARS BEING CONSIDERED

Car "A" _____ (MAKE)

Car "B" _____ (MAKE)


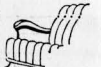





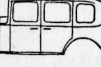

Car "C" _____ (MAKE)

"Things that I want to bear in mind when selecting my new car."

(Before setting about to buy your new car perhaps it would be a good idea to jot down the items on your present car which you would change if you were re-designing it to suit your own personal needs.)

"SCORE CARD"






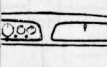







on New Cars being considered. Indicate with ☒

FEATURE	NOTES AS TO MY PREFERENCES	O. K. On Car "A"	O. K. On Car "B"	O. K. On Car "C"
 Adjustable Front Seat		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 Arm Rests		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 Ash Trays		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 Assist Cords		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 Automatic Choke		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 Battery		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 Body		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 Brakes		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 Chromium Trimmings		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Lots of Chromium plating	<input type="checkbox"/> Restrained use of Chromium	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

"Things that I want to bear in mind when selecting my new car."












"SCORE CARD"

on New Cars being considered. Indicate with ☒












FEATURE	NOTES AS TO MY PREFERENCES	O. K. On Car "A"	O. K. On Car "B"	O. K. On Car "C"
 Cigar Lighters		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 Color		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 Control Levers		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 Cowl Ventilators		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 Curtains		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 Dash Compartment		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 Dash Insulation		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 Dash Light		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 Dimmer Control		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 Dome Light		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 Doors		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 Door Handles		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 Door Locks and Keys		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Don't rely on memory. Plan your purchase in advance.

"Things that I want to bear in mind when selecting my new car."












"SCORE CARD"				
on New Cars being considered. Indicate with <input checked="" type="checkbox"/>				
FEATURE	NOTES AS TO MY PREFERENCES	O. K. On Car "A"	O. K. On Car "B"	O. K. On Car "C"
	Door Pockets	?	?	?
	Fenders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Floor Coverings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Foot Throttle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Gas Gauge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Gas Tank	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Headlights	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Horns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Ignition Lock Location	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Jack	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Pedals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

"Things that I want to bear in mind when selecting my new car."

"SCORE CARD"				
on New Cars being considered. Indicate with <input checked="" type="checkbox"/>				
FEATURE	NOTES AS TO MY PREFERENCES	O. K. On Car "A"	O. K. On Car "B"	O. K. On Car "C"
	Radiator	?	?	?
	Radiator Drain Location	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Radio	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Rear View Mirror	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Running Boards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Safety Glass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Seat Cushions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Spare Tire Mounting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Speedometer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Starter Control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Steering Wheel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Don't rely on memory. Plan your purchase in advance.

"Things that I want to bear in mind when selecting my new car."

"SCORE CARD"				
on New Cars being considered. Indicate with <input checked="" type="checkbox"/>				
FEATURE	NOTES AS TO MY PREFERENCES	O. K. On Car "A"	O. K. On Car "B"	O. K. On Car "C"
	Sun Visor	?	?	?
	Tire Valves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Tools	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Transmission	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Upholstery Materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Ventilation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Wheels	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Wheel Suspension	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Window Cranks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Windshield	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Windshield Wiper	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



SUMMARY

(Pages 66 to 70)

Count the items that are checked "OK" ☒ for each car on preceding pages:

NEW CAR "A"—Number of Items Checked "O.K." _____

NEW CAR "B"—Number of Items Checked "O.K." _____

NEW CAR "C"—Number of Items Checked "O.K." _____

But from your standpoint some of the items listed on pages 66 to 70 are *MORE IMPORTANT* than others—so perhaps you may want to go back and give consideration to this.

Then check off ☒ your REVISED RATINGS:

	1st Place		2nd Place		3rd Place
New Car "A" _____	<input type="checkbox"/>	— or —	<input type="checkbox"/>	— or —	<input type="checkbox"/>
New Car "B" _____	<input type="checkbox"/>	— or —	<input type="checkbox"/>	— or —	<input type="checkbox"/>
New Car "C" _____	<input type="checkbox"/>	— or —	<input type="checkbox"/>	— or —	<input type="checkbox"/>

Miscellaneous _____

notes _____

and _____

observations _____

"THE DEMONSTRATION"

—a few hints



1. Is the driver's seat easy to adjust and is it firm and steady after it's adjusted? Is the steering wheel located in a natural, comfortable position? Are the instruments easy to see—without taking your attention off your driving?

Car "A"? ☐

Car "B"? ☐

Car "C"? ☐

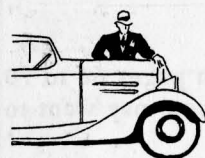


2. Are the pillars to left and right of the windshield slender enough to prevent "blind spots"? Is the rear window big enough and properly placed to give you a full, clear view of the road behind?

Car "A"? ☐

Car "B"? ☐

Car "C"? ☐



3. Does the chromium give an uncomfortable glare? (Never mind how smart it may look in the show room.) Is the starter control convenient and easy to operate? Could you find it in a traffic emergency without fumbling?

Car "A"? ☐

Car "B"? ☐

Car "C"? ☐

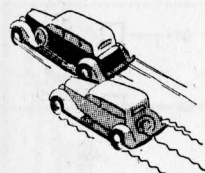


4. Does the clutch pedal depress lightly? Is the gear shift lever easy to reach? Is the shift "velvety" or do you have to "humor" it? Does the clutch take hold smoothly and without chatter? Are the gears quiet, or noisy?

Car "A"? ☐

Car "B"? ☐

Car "C"? ☐



5. Does the engine warm up quickly or do you have to "baby it along" for awhile? How about "Pick-up"? In low . . . second . . . high. Has the car enough life for you? Does it glide into high momentum in a flash? Or does the engine seem to make hard work of it?

Car "A"? ☐

Car "B"? ☐

Car "C"? ☐



6. Shift into high. Don't feel that it's necessary to "baby" the gears. You should be able to do this smoothly and confidently . . . without jerking or clashing—and don't forget to try out the shift from high back into second at 15 or 20 miles an hour.

Car "A"? ☐

Car "B"? ☐

Car "C"? ☐



7. How about the space required for turning around? Is the car easy to park in limited space? Can you maneuver with easy precision?

Car "A"? ☐

Car "B"? ☐

Car "C"? ☐



8. Now try the brakes. Easy pedal pressure? Instant response? Smooth operation? Quiet? Positive? Nice "feel"? Does the car keep to its course when you apply the brakes, or does it sway to one side? Can you slow down as smoothly as you speeded up? Is the braking system powerful enough to check your speed instantly?

Car "A"? ☐

Car "B"? ☐

Car "C"? ☐



9. How about the top speed? Does it seem to come hard? Is it much more effort to get past 60 than past 40 or 50? Is the car easy to control at high speeds? Does it have a good sense of direction or do you have to keep tugging at the wheel? Are you gripping hard—tense—or do you feel at ease—relaxed?

Car "A"? ☐

Car "B"? ☐

Car "C"? ☐



10. Does the car hug the road and give you a feeling of stability and safety even at high speeds? Does it seem to level off the bumps in the highway or does it exaggerate them? When turning a corner does the "backbone" of the car seem rigid and solid, or does the body seem to sway and throw you toward the outside of the curve?

Car "A"? ☐

Car "B"? ☐

Car "C"? ☐



11. How about rough roads? Any road shock reaching the steering wheel? (With up-to-date construction there shouldn't be.) Do the bumps tend to pitch you forward? (No excuse for THAT any more!)

Car "A"? ☐

Car "B"? ☐

Car "C"? ☐



12. Can the car be properly ventilated—rain or shine? Try the rear seat—any drafts on the back of your neck? How are the rear seat cushions and backs? Leg room? Seat width? Window controls? Noise?

Car "A"? ☐

Car "B"? ☐

Car "C"? ☐



13. Do the doors have a pleasing "mellow" sound when you slam them or are they "tinny"? Pound your fist against the side of the body—do you get a deadening "thud" or a tinny rattle?

Car "A"? ☐

Car "B"? ☐

Car "C"? ☐



14. Then stand on the running board and punch your fist down against the top of the roof in several places—is it firm and substantial or is it a flimsy "chicken wire" construction?

Car "A"? ☐

Car "B"? ☐

Car "C"? ☐

Our book draws to a close

-back on pages 6 to 17 we gave you some idea of the things that motorists stressed in answering our questionnaires.

-on pages 18 to 35 we attempted to review the more important developments in automotive design during the past 5 years -in their relation to your requirements as a practical motorist.

-then on pages 36 to 60 we took you behind the scenes and tried to give you some idea of the things that have to be done to give you what you want.

-on pages 64 to 71 we included "check sheets" to help you in crystallizing your personal desires in advance of the time when you are ready to buy your new car -and on pages 72 and 73 we've made a few suggestions as to how to get the most out of the demonstration.

* * * * *

And now on the opposite page we've tried to work out a little scheme that might help you in summarizing your final conclusions.

It's an interesting sort of thing -that is if you want to bother with it. It's patterned after a system that's used by these modern psychologists in analyzing things that are hard to measure through the ordinary methods.

*- getting too complicated -
just jot down some
rough figures and see
how they work out -
- or else skip to
page 77*



FINAL SUMMARY

Suppose, in your judgment, NEW CAR "B" is the most dependable -then rate it 100% on DEPENDABILITY.

Now, if Car "B" is rated 100% on DEPENDABILITY -what rating would you give Car "A"? -perhaps 90% or maybe only 75%.

-and how about Car "C"?

Repeat the same procedure with "ECONOMY," "SAFETY," "COMFORT," etc.

See Pages:	GENERAL CHARACTERISTICS	New Car "A"	New Car "B"	New Car "C"
18	Dependability			
20	Economy			
22	Safety			
24	Appearance			
26	Comfort			
30	Ease of Control			
26	Smoothness			
34	Pick-up			
34	Speed			

-now add the vertical columns and see which product gets the HIGHEST SCORE.

Here again you may want to revise the ratings -giving weight to those characteristics which YOU consider most important as indicated on page 15.

And In Conclusion

Again we want to thank the thousands of owners of all makes of cars who cooperated with us in our consumer surveys upon which this book is largely based.

As stated in the beginning, it is not the purpose of this book to tell you what car you should buy —but rather to bring before you some facts that might aid you in arriving at a sound decision.

While it has been our aim to make it *more informative and more complete* than anything of its kind ever issued before, it really doesn't come anywhere near covering the subject.

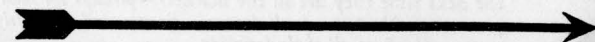
It is estimated that the automobile of today contains from 20,000 to 30,000 separate parts —depending on how far you go in counting such little things as bolts, nuts, washers, cotter keys, etc., *but to cover even the more important items would require a book many times this size.*

And yet, even this little book, in spite of its inadequacy, probably contains more details than the busy person will want to check into.

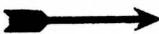


Perhaps, after all is said and done, the easiest way to become a shrewd automobile buyer is to choose, not so much the car itself, but the manufacturer back of the product—in other words, select the institution which you feel is best fitted to serve you and then "UNDERWRITE" YOUR INDIVIDUAL TRANSPORTATION PROBLEMS TO THAT INSTITUTION.

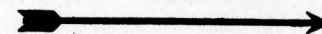
—so with this thought in mind we invite your special attention to the following pages:



Choosing the COMPANY —instead of the CAR

The Companies back of the products being considered: 		Co. "A" O. K. ?	Co. "B" O. K. ?	Co. "C" O. K. ?
1st. PERMANENCE:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is it a stable institution? Is it strong financially? Is it in business to stay?				
2nd. EXPERIENCE:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has the company an adequate background of experience in designing and building motor cars and does it capitalize this experience in a progressive manner?				
3rd. RESEARCH AND TESTING:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
What are its facilities for safeguarding the purchaser's interests through avoiding unproved features and at the same time providing products that are advanced in design? (This has an important bearing on the question of depreciation and future trade-in value.)				
4th. PRODUCTION ECONOMIES:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does the company enjoy a sufficient share of the business to assure maximum economies in its purchasing and manufacturing operations?				
5th. PRICES:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are its products fairly priced on a sound basis of value?				
6th. TIME PAYMENT POLICY:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does the institution take an interest in the time selling methods employed by dealers in its products and assure itself that the installment buyer is as economically and efficiently served as possible; or does it leave this feature to take care of itself?				
7th. SERVICE:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the company's interest limited to the building and selling of new automobiles or does it concern itself with the rendering of a broad service in the field of individual transportation? What is the service policy? What is the extent and scope of the service organization? What steps are taken to assure expertness on the part of the local service personnel? — and are the charges fair and equitable?				
8th. CUSTOMER ATTITUDE:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
What is the company's general attitude toward the Customer? Does it assume a dictatorial position — expecting the public to adjust itself to the company's own ideas or does it bend its efforts toward meeting the public tastes — toward serving the customer in the way that the customer wants to be served?				
9th. DEALER RESPONSIBILITY:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
What is the calibre and standing of the local representation?				
10th. OWNER LOYALTY:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do its present owners expect to buy the same make of car the next time they are in the market? — perhaps the most important consideration of all because, directly and indirectly, it pretty well reflects all of the foregoing.				

Irrespective of whether you base your choice ON THE PRODUCT, OR ON THE COMPANY BACK OF THE PRODUCT, — we of the General Motors institution, solicit the opportunity to serve you and we invite your careful consideration of our POLICIES AS WELL AS OUR PRODUCTS.





ADVERTISEMENT

THANKS to the motoring public, who have so generously co-operated with us in responding to our questionnaire "*The Proving Ground of Public Opinion*," we believe that the new General Motors offerings come more nearly meeting the fastidious requirements of the automobile buyer than any line of cars ever before produced by General Motors or anyone else. In these products, General Motors' talents and facilities have been *defly directed* toward meeting the preferences, needs, tastes and desires of the practical motorist, even down to the most minute detail—with the result that these new General Motors offerings take on added significance as "*measuring sticks of value*"—as standards against which to compare other products.

So, irrespective of what car you may now own—and irrespective of what car you may have made up your mind to buy—we earnestly invite you to see these new General Motors products—ride in them, study them—if for no other reason than to get the benefit of the reflected advice of the thousands of practical motorists who have contributed to their design.

General Motors dealers everywhere await with keenest anticipation the opportunity to give you and your friends a ride in these new products—and there will be no obligation.

GENERAL MOTORS

CHEVROLET • OLDSMOBILE • PONTIAC • BUICK
LA SALLE • CADILLAC • BODIES BY FISHER
GMC TRUCKS • FRIGIDAIRE

General Motors has been making consumer surveys for many years past—if you are interested in the background of this activity we'd be glad to send you a little brochure titled "*The Third Link in General Motors Fact Finding*." Address Customer Research Staff, General Motors, Detroit.

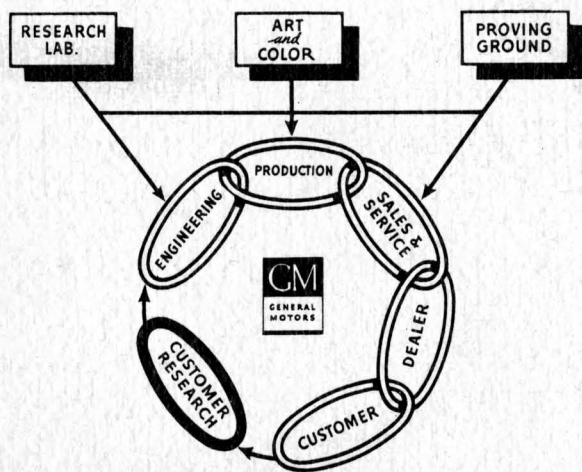


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Perhaps from time to time you may learn of some friends who are contemplating the purchase of a new car. If you have found this book interesting and helpful, perhaps you may want to send us their names so that they too may receive a copy of "The Automobile Buyer's Guide". Write Customer Research Staff, General Motors, Detroit.



★ ★ the completing link
in a long chain of service