WE DRIVERS

☆ GENERAL MOTORS ☆

"We may already know everything contained in the following pages—know them so well, in fact, that we're apt to get careless about them. Because we can drive almost automatically, we're apt to go rolling along thinking of something else. Then all at once our eyes have an important message for our brain, but when they try to get the message through, the line is busy.

"So it doesn't pay to let our thoughts go wool-gathering while we are driving, and it might pay to sharpen up our memories on the things we already know."

WE DRIVERS

A series of brief discussions on driving, dedicated to the safety, comfort and pleasure of the motoring public.

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☆ FOREWORD ☆

NOBODY KNOWS so well as we drivers, how dependent a machine can be upon the man who runs it. Certainly everything has been done that could be done to make motor cars operate as they should regardless of the driver's skill. And still, cars can't do a thing except under human direction.

Even the self-starter, for example, deserves its name only in part. There must still be a foot to press the pedal or a finger to touch the button or turn a key. Power and speed in abundance are waiting in modern engines . . . but they await the command of a driver. Steering is a direct and simple thing, but it still depends on a pair of hands on the wheel.

And so, in a very true sense, the automobile that comes to us from the factory is an unfinished mechanism. It still lacks the most important part . . . *the driver.*

Manufacturers may build into their cars any number of provisions for economical operation, comfort, ease of control, fine performance, safety, dependability and long life; yet all are subject in the long run to the intelligent use and maintenance of drivers and owners.

The satisfaction and service that the owner gets out of his car depend in a great measure on his ability as a

driver and even more importantly, the safety of our streets and highways is also dependent on the skill and expertness of the person behind the wheel.

It was with these thoughts in mind that General Motors felt it might be constructive to develop a brief series of talks dealing with the problems of the driver.

In the development of these talks the experience of General Motors engineers, Research specialists and Proving Ground operators was freely drawn upon—but even more importantly, they reflect the viewpoints of a great number of practical motorists—owners of all makes of cars who have so generously co-operated with us in our Customer Research Surveys.

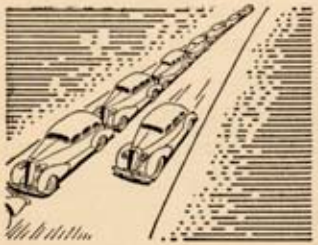
In presenting this booklet to the motoring public we want to make it clear that all we have tried to do is to serve as a "clearing house" for practical driving information sufficiently broad in its treatment to be useful to the owners of all makes of cars and while these suggestions are not offered in any spirit of authority, we do hope that they may help you to get greater satisfaction out of your car and that they may contribute toward making our highways safer.

I. CURVES AND TURNS

NO MATTER how expert we may be as drivers, we are all apt to fall into habits of driving that don't quite measure up to what we really know is right.

For instance, we all know that we ought to be careful about passing cars, especially when another car is approaching from the opposite direction.

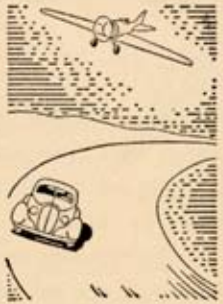
And yet there possibly isn't one of us who hasn't, at one time or another, moved over in the road to pass a car, and then wondered if we would get around in time.



Now here's an interesting thing about that. When we try to pass a car that's going, for instance forty miles an hour, it's just the same as if we tried to pass a standing string of cars 300 feet long or more, depending on our own speed in passing. In other words, it's like passing at least *eighteen* cars parked bumper-to-bumper in the road. This is probably a new idea to most of us. If we kept this helpful fact constantly in mind, the chances are that we would never pass the car ahead of us unless we were absolutely sure that there were no oncoming cars for a good long distance ahead.

But turning aside to pass is not the particular kind of turning that we are interested in discussing here. What we are now concerned with is taking curves and corners. From time to time in these discussions we will find that the same old laws of Nature will be involved. Foremost among them will be the laws of momentum, and momentum plays the major part in going around curves. Because momentum not only wants to keep us going, but going in the *same direction*. When it is trying to make us go straight instead of curving our course, it operates under an assumed name, if you please. For then we call it "centrifugal force."

Now of course we all know what centrifugal force is. We feel it when we go around curves. Highways and railroads are banked at curves to offset centrifugal force. Aviators bank their planes at turns by tipping them with the controls. But even though we all know about centrifugal force, few of us realize how powerful it is, and how much greater it gets the faster we go.



A 3000-pound car making a turn of 500-foot radius, has to overcome

a centrifugal force of only about 156 pounds at 20 miles an hour. But at 30 miles an hour, that force has grown to 360 pounds, and at 60 it is nine times as great as at 20 . . . over fourteen hundred pounds trying its best to push us off the road! The only thing that keeps us on the road in the first place is the friction between our tires and the road. The minute the centrifugal force gets stronger than the force of that friction, off the road we go.

The trouble is that we often don't realize how fast we're going. On road trips, for instance, after we have driven at a certain speed for a long time, it seems a small matter to increase our speed a few miles an hour. Then

after a while we may do the same thing again. In other words, we keep putting forward our basis of comparison till by-and-by we have lost our usual sense of how fast we are going. Then, the first thing we know, we are face-to-face with a turn or even half way around it and we feel Old Man Centrifugal Force trying to push us off the road.

So what do we do? We clamp down the brakes. It's the only thing we can do when we find we're going too fast. But just the same, approaching that corner too fast has kept us from taking it as we should have liked to. For if

conditions permit, it is often desirable to increase speed as we go around a curve. As long as our rear wheels are not being retarded, but are actually pushing us around the curve, our steering is effective and our car is under control.

The long and short of it is that we can't take liberties with the laws of momentum and centrifugal force. Man's speed laws may not always be observed, but Nature's speed laws always are!

II. NIGHT DRIVING

IT'S JUST AS TRUE as can be that when people get expert at anything they're apt to begin getting careless about it, and that's what we have to look out for when driving our cars. For instance, we recently heard a group of engineers discussing night driving, and one thing they kept talking about was "over-driving our headlights."

Now that term seems to be a common one with them, but it's new to most of us.

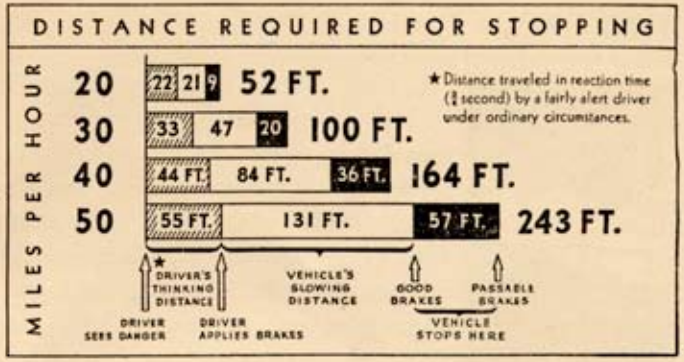
What they mean is that the distance we can see clearly by headlights is, of course, limited, and that we are apt to let our car speeds get beyond the point where we could easily stop within that limited distance. It's true that we naturally tend to go a little slower at night. But if we aren't careful we gradually get going faster than we realize,

and that may get us into trouble. You see, momentum, the same force that tries to keep us from making turns safely;

that cuts all kinds of capers on slippery roads . . . never sleeps! He works on the same old principles night and day. Darkness doesn't hinder him, but it does hinder us.

Most modern headlights are pretty wonderful lights, but after all they don't give us the distance or clarity of vision that daylight does. So, on considerably shorter notice than in the daytime a vehicle or pedestrian can come out of the darkness. Almost before we know it we may have to slow down or stop for someone or something on the road . . . perhaps one of those big powerful trucks that you barely see till you're right up on them; or a car whose tail-light has gone out . . . an unexpected curve, or what not.

And that's where we meet up with momentum again. You see, stopping isn't the one simple action we always thought it was. The truth is, we are told, that there are really *three* things we have to do to stop. First we have to think of stopping. Next we have to move one foot over on to the brake pedal. And then we have to push down on the brake pedal.



Now we might not believe it, but they tell us those first two steps take time. Less than a second, perhaps, but even in that instant momentum is carrying us on. In fact, at only 20 miles an hour the average driver goes 22 feet before he can even start to use the brakes. Then after he does get the brakes to working, it takes him another 21 feet or more to stop completely, even with brakes in good condition and with good tires, under favorable road conditions. At least so we are told by a great safety organization which has made intensive study of drivers and driving conditions, and which has prepared the data for the above chart.

The important thing to realize is that distance needed to stop increases a great deal as we increase our speed.

We just have to remember that when we're moving along in a car, we think by the foot, act by the foot and

stop by the foot . . . and that if we aren't careful, it's pretty easy to get going faster than is really safe.

Now, just as engineers have told us how to operate in safety with our own lights, many experienced drivers have pointed out how to avoid trouble from other people's lights. They say that all we have to do, when passing other cars at night, is to stop looking at their lights and watch the right-hand side of the road.

If we keep our eye on that, and stay just as close to it as we should, we won't have to worry about getting too close to the other fellow, and his lights won't be in our eyes at all.

And, of course, we will remember that how our own headlights affect other drivers on the road has a lot to do with both their safety and ours. So it's important to switch to a passing beam or lower beam whenever another car comes in sight.

The truth of the matter is that night driving can be just as pleasant and just as safe as day driving. But we do have to be just a little more alert, a little more careful, and a little more considerate of other drivers.

III. MIST AND FOG

SO LONG as there is light we may skip around at a lively rate over this old globe of ours. We may span oceans in surprising time. We may cross the continent from sun-up to sun-down.

But every now and then Mother Nature decides to put us in our place, and of all her devices to make us slow down, none is more effective than mist and fog.

Now we may not have to contend with fog and mist very frequently, but we're bound to now and then, and when we do, it can cause us a lot of annoyance and trouble.

When a good heavy fog comes—on land, at sea or in the air—everything that moves, moves with caution. The ocean liner slows down several knots an hour. Lightships signal, buoys sound and foghorns boom. Airlines ground their planes and cancel trips. Even trains on tracks reduce their speed—and we drivers on the highways, too, must make our way cautiously through that baffling screen. For one thing is true. In spite of all our progress, transportation still depends on pairs of eyes in human heads.

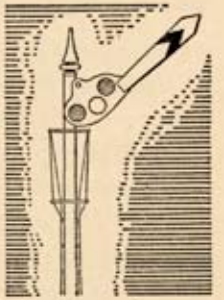
Scientists who have studied fog, say that it is composed of tiny drops of water. These drops are so small and light that they hang in the air, and so close together that light can hardly get through them. Instead, these little drops act like tiny convex mirrors. When we try to pierce them with a beam of light, a great deal of it is thrown right back at us, so the effect is just like a great, gleaming white curtain in front of us.

HOW MIST DROPS REDUCE ILLUMINATION

Experienced drivers say that the first thing to do is to get our lights right. The main thing is to direct the beams downward. If we have them shining straight ahead, those little mist-drop mirrors reflect the rays back in our eyes. But if they're pointing downward, the rays are deflected toward the road.

Then they say it's a good idea to guide by the road edge at our right, and if we have a spotlight on our car, to focus it right on that road edge, close to the front of the car, so the edge will be clearly lighted. But we have to keep a good weather eye ahead, too, because fog veils more than the road. It hides not only things on the road but such things as roadside warnings of curves

and hills and intersections. Even the traffic light's red and green signal rays have the same hard time that our headlights do getting through that strange haze. In fact, in a good heavy fog, the best we can do for our vision is none too good. And so the main thing is to slow down. The ships have to do it, the trains have to do it, and we have to do it too. If we won't make up our minds to that, they tell us the best thing we can do is to pull off the road, or if we have not yet started out, we had better just stay home.



But seeing in fog and mist is only half the story. We not only have to *see* but we also have to *be seen*. Our headlights properly adjusted are strong enough to do their duty in pointing us out to people coming from the opposite direction. And, in addition, some drivers use their horns like foghorns by giving them a toot every now and then. But another thing we have to think of is to be sure drivers behind us see us. That's why it's so important to have our stop-signal and tail-light working when we're driving in fog. And so it's a good thing to make sure that these lights are working and to wipe off those little red glasses if they happen to be covered with mud. If the weather's clear and our tail-light has gone out, the other fellow's lights may point us out fairly well. But if his headlights are fighting fog, they can't do much to protect us.

So, when all is said and done, driving in fog is just a matter of having our headlights and tail-lights right and being a little more careful. If we do that, we can drive our cars safely, even through Nature's stubborn obstacles of mist and fog.

IV. OUR BRAKES

WE'VE all noticed that whenever a train makes a long enough stop in a station, there's somebody on the job, dodging in and out under the cars making sure that everything is in good shape for the train to continue its trip. One of the things checked at every inspection point is the brakes. For nobody knows better than railroads how important it is to be able to stop when you have to stop.

Now, if we think of it in a certain light, we people who own automobiles are all running little transportation systems of our own . . . just like the railroads and airlines and bus companies. Home is the main terminal and there are lots of stops along the line . . . flag stops, you might say, and regular scheduled stops—like the office, the grocery store, the school, the theatre, and our friends' houses.

Just like the railroads, one of the main things we need to look out for is our brakes. Of course, everybody knows this and yet somehow or other we're apt to be a little careless about it. Not that the brakes don't give us plenty of notice when they're going to need adjustment. As time goes on we find that we can push the pedal lower and lower, till after a while we can shove it down almost to the floorboards before the brakes take hold. Even then we sometimes wait quite a while before we have them adjusted. It just seems to be human nature to put off things like that. And they tell us the result is that one third of all the cars on the streets and highways at any given time have something wrong with their brakes.

The trouble is that when we let our brakes go like that, all of a sudden we may have to make an emergency stop, and we may find it rather embarrassing.

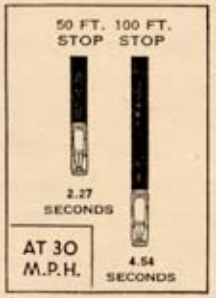
Engineers say that if we realized what goes on in brakes we would see why we ought to keep them checked up. As they explain, it's a story of momentum and friction, the same old forces we've talked about before.

They say that when we get going we build up a certain energy in the form of momentum. Now when we want to stop, we can't just destroy that energy, because, scientists tell us, Nature never lets any of its energy be destroyed. We can only convert it into some other form of energy.

What brakes really do is to convert *speed-energy* into *heat-energy*. When we push down on the brake pedal we press the brake lining against the brake drums and this creates friction that changes the energy to heat. When we have changed all the speed energy to heat, then we come to a stop.

Now modern brakes are very powerful. In fact, a 100-horsepower car will have about 500-horsepower brakes. They can stop us pretty quickly even from high speeds. But when they do, they simply change those speeds into a great deal of heat, in a very short time. The fact is we sometimes build up temperatures in our brakes as high as 1400 degrees!

It's easy to see that heat like that can cause a lot of trouble. Some of us may think it's fun to rush up to sudden stops, but we might as well realize that we have to pay for that kind of fun in excessive brake wear. It simply doesn't pay to build up brake heat a lot faster than it can be thrown off. And we certainly get hardly anything back in time saved. For instance, if we're going 30 miles an hour, our brakes can stop us in 50 feet if they are all right; but it takes them only two and a quarter seconds longer



to stop us in twice that distance. How much better it is, under any normal circumstances, to begin to apply the brakes a few seconds earlier and, with gradually increasing pressure, bring our car to an easy stop. As a matter of fact, smooth, gradual stopping, wherever the circumstances permit, is generally taken as a sign of a good driver.

Now if we want to keep our brakes safe and sound, it's important to remember what these fast stops do to them. But it's just as important to remember that all stops generate some heat in our brakes. That's what gradually wears down the linings, and sooner or later makes a brake-adjustment necessary. And that's why we must watch them and see that adjustments are made when they are needed.

So maybe it would be a good idea to keep on thinking of our cars as private transportation systems. It's just as easy for us as it is for the railroads to keep them in good running condition, so they will serve us with safety and satisfaction.

V. DRIVING ON HILLS

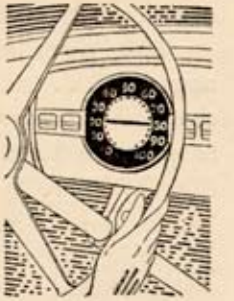
IN SOME parts of the country hills are taken for granted . . . and good steep ones, too. But for some of us who live in flatter country, hill driving is not so familiar.

As a matter of fact, there are several conditions peculiar to driving in very steep hills or mountains, especially if the altitude is high. For instance, a car that develops 100 horsepower at sea-level, has only 82 horsepower at an altitude of 5000 feet, and only 60 horsepower on top of Pike's Peak.

Another thing is that sometimes grades are deceptive and we don't realize how steep they are, if there is no level ground to judge by.

So if we go on a road trip and happen to get into country where hills are hills, we often have no idea of what is in store for us. Like as not, we will come rolling up to a hill, taking it for granted that we'll make the grade. But before we've gone very far we find that our power seems to be giving out, and we're slowing down. Then we realize we must shift to second gear, but we're lucky if we haven't found out so late that there we are, stalled on a hill!

Now people who drive on hills all the time say one thing to remember is that there's nothing like a good start. Of course, this is true, because the minute we start up, gravity starts to work and work fast. Yard-by-yard it uses up our momentum till by-and-by that momentum is just about gone. Then we have to shift to a lower gear to increase our power.



Experts tell us that by far the most common fault in hill-climbing is failure to shift to a lower gear soon enough. So just to be sure, some drivers set a definite point at which to change gears. The consensus of opinion seems to be that we should always go into second gear as soon as our speed gets down to 20 miles an hour.

There are times, however, when we want to stop on a hill. So it's important to know how to start again, with our car on an upgrade. And there seem to be two methods used by experienced drivers.

Some use their foot brake to keep their cars from rolling backward, put their engine in low gear and accelerate slowly with the hand throttle, gradually engaging their clutch and releasing the brake at the

same time. Other good drivers do exactly the same thing, only they use the hand brake and the foot accelerator. But both groups tell us it doesn't make much difference . . . to use whichever method we happen to like the better.

Now there aren't many hills that cars can't climb nowadays . . . and what goes up must come down. And that's where we have to look out for momentum. He may have been a friend in need when we were coming up hill,

but going down he'll run away with us if we aren't careful. And if there are any sharp curves or any bad bumps or loose gravel, we have to be careful or he'll pitch us right off the road.

Many drivers say that we should go down a hill in the same gear we would use to get up. In other words, if it's steep enough so we would have to go up in second or even low gear, then we'd better get into that same gear before we start down. If our car is in second or low gear, our engine works as a very effective brake, and besides it saves a lot of wear on our real brakes.

Speaking of gears, experienced drivers say we should never, under any condition, disengage our clutch and coast downhill. That's just what momentum is waiting for. Just give momentum a free rein, without our engine to check it, and nobody can tell what's going to happen.

When we do get in country where people are used to

driving on hills all the time, it may seem to us that they take those hills without the slightest concern. But if we were in their cars with them and could watch them closely, we would see that they take all these precautions we have mentioned, just as a matter of habit. And one thing is sure. They make it a rule never to pass other cars on hills, or get on the wrong side of the road, when they can't see far enough ahead to be sure whether anyone's coming.

VI. POWER AND SPEED

MOST of our motor cars will go so much faster than we ever care to drive them, that no doubt people often wonder why so much speed is built into them in the first place. Of course, automobiles aren't built with the idea of pleasing the manufacturer or the engineer or the salesman. They're built to suit the men and women who are going to own and drive them. And there are certain things that people do insist on in their cars. It happens that some of those things are of such a nature that when the engineers provide them, an ability to go fast just naturally results.

For instance, nearly everybody likes to get going as promptly as possible. Now that's just a matter of the power we have in our engine and how our car is geared.

Then there's the business of hill-climbing. That may not mean as much in some localities as in others, but cars have to be built to suit us whether we live in Maine or Florida, Iowa or California—wherever we may live and wherever we may want to go.

Engineers tell us that they could build a fairly low-powered car that would pull us up the steepest hill. But if they did, they would have to gear it so low that when we got over the top and onto a level stretch, we could only go crawling along at a rate that wouldn't satisfy even the most conservative drivers.

But perhaps the most important reason for having our power what it is in modern cars, is a matter that many of us have never considered. We all know what happens to us, when we, ourselves, are going at high pressure all the time, either physically or mentally. A person can work 12, 14 or 16 hours a day, but we know we get along best when we don't tax our last reserves of energy all the time.

In the same way, anybody who has ever run machinery knows that if you keep it going at full capacity and full speed day-in-and-day-out, you're just

multiplying the chances of a breakdown, sooner or later.

And that's how it is with a car. By building in the ability to run at high speed, engineers make it practical to run at reasonable speed. If our car can go seventy, eighty or maybe even more miles an hour, then it won't have to strain to go thirty-five, forty, or somewhat faster if circumstances demand. So we can drive it along at sensible speeds hour after hour, day after day, without over-working it.

When we stop to think about it, lots of things are built with that added safety margin. Elevators in our office buildings could carry far heavier loads than the weight of all the people they can hold. So could modern bridges. The steel girders of our buildings, the rails under our trains—in fact, any number of things we depend on day-by-day—are much stronger than they really have to be. They all have that extra margin of protection.

So, with our cars, what we have to remember is that speed is simply a by-product of power. We can use that power unwisely, or we can use it sensibly and get better performance and dependability as the result. Manufacturers can't decide that. It's all up to us.

VII. SLIPPERY WEATHER

ICE AND SNOW always bring problems for drivers. These problems are the result of less friction. And that is interesting, because usually we are trying to reduce friction all we can. We use ball and roller bearings to overcome friction. We smooth and polish parts to reduce friction. We put oil in our cars to avoid friction. But we can't get along without friction, just the same.

For, after all, we couldn't start a car, we couldn't stop a car, we couldn't turn a corner, if it weren't for friction. The friction between the road and our rubber tires is what gives us traction.

Most of the time we have plenty of traction. But in certain climates every year, Winter comes blowing and blustering down from the North, and the first thing we know he has spread ice and snow over our roads, and our whole traction condition is changed.

But automobiles are pretty well prepared these days to meet any conditions. All we have to do is to adjust ourselves to these changed circumstances.

For instance, many skillful drivers start their cars in high gear on very slippery, icy streets. Ordinarily this

would be a bad thing to do. But when our tires have to start us going on slippery ice or snow, starting in second or "high" is harmless and it does help to avoid spinning wheels, side slipping, and difficulty in getting under way. If you haven't tried this after stopping at intersections, you may be surprised to find out how much more quickly you get started again. Only remember to engage the clutch *very slowly*.

This business of starting in slippery weather can be quite a problem. But stopping is even more so. However, most good drivers agree on one method that they find quite satisfactory. First of all they begin to slow their cars down at quite a distance from where they want to stop. They press the brake lightly at first and release it almost at once. Then they press again and release quickly. By a series of brief, moderate brake actions, instead of one continuous pressure, they gradually reduce speed and can usually stop without skidding.

Many of the best drivers always make it a point not to disengage the clutch as soon as they apply their brakes, but to wait until the car has almost stopped. While this is their general practice, they say it is espe-

cially important on slippery roads, as they claim it reduces the chances of skidding. But if we use this method there is one thing we must look out for. We have to remember that on a slippery surface it is very easy to stall our engine by using our brakes when the clutch is still engaged.

Outside of starting and stopping, most winter skidding is at turns and curves. Many good drivers tell us that they treat every slippery curve or turn as though it were going to be a stop. In other words, they approach curves using the very same system of short, moderate brake actions. The result is that when they reach the curve they are going so slowly that they can actually give the engine a little gas and put some power in the wheels. With power turning the wheels, we are not so likely to skid.

After all, the main thing to do about driving in slippery weather is just what we do about walking in slippery weather. We are all pretty careful about that. The first thing most of us do when we go out on a slippery morning is to put out one foot cautiously and get the feel of the surface to see how careful we have to be. The best drivers we know do practically the same thing with their cars. The first

thing they do after they get started, is to test the surface. They make sure that there are no cars too near, and then they gently apply the brakes. If they don't skid they resume speed and apply the brakes again—this time a little more firmly. In this way they determine the surface and know the degree of caution they must exercise to be safe. This seems like a very sensible idea.

VIII. CITY TRAFFIC

WHEN we look down from a tall building and watch the traffic in the streets below, we wonder how in the world all those cars can keep moving along . . . crossing intersections, passing each other, turning in and out of parking positions . . . without getting hopelessly tangled.

As a matter of fact, from away up there, we do see traffic jams now and then, and many times the reasons for the trouble are just as plain as day. Someone will try to turn from a wrong position, and in a few seconds the whole line of cars is thrown out of kilter for blocks. Or a pedestrian will dart out in front of a car so the driver has to slam on his brakes,

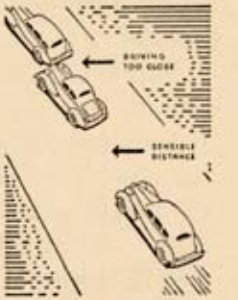
and one after another the cars behind him have to do the same thing. Then there is apt to be a great blowing of horns that only adds to the confusion.

But when we become part of that traffic our whole viewpoint changes. We can't see those things going on up ahead that make us stop and start and stop again. And we can't see around corners or up alleys. And the worst of it is we can't look into other people's minds . . . the driver who makes a sudden turn, or the pedestrian who decides to do something we can't foresee. The interesting thing is that what pedestrians do may seem strange and illogical to us while we're driving; but we're all leading double lives . . . sometimes drivers, sometimes pedestrians . . . and it's funny how our psychology changes when we change from one to the other.

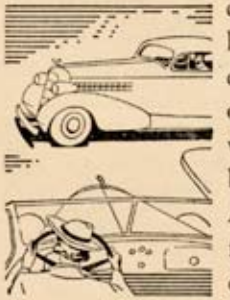
Anyhow, things can happen all-of-a-sudden in our crowded cities and we have to be ready for them. And so, as one driver has said, we have to drive along with every intersection, every alley, every car . . . under suspicion. We all like to think it was the other fellow's fault when we get into trouble. But, as we have been reminded, if we're sufficiently alert we don't let the other fellow's mistake get us into trouble.

Expert drivers tell us there is just one thing to do . . . to give ourselves a margin of safety . . . a reserve of space and a reserve of time.

It's an easy matter to take a reserve of space. They point out that we don't have to drive right up almost bumper-to-bumper with the car ahead. If we do, the chances are we can't stop as quickly as we may need to . . . if he suddenly stops, slows up, or makes a turn. But if we drop back a little, and take a little extra room, we won't have to worry about "stopping on a dime" or turning out at right angles to avoid bumping. And we won't pick up such a fine collection of nicked fenders and bent bumpers, either.

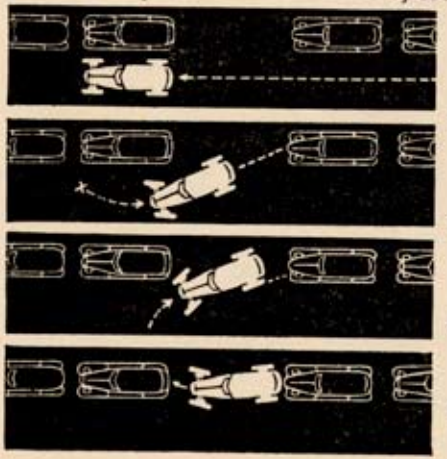


But a reasonable interval of space, or even clear sailing, for that matter, won't do us much good if we don't keep a time margin of safety too. In other words, we don't want to go so fast that we won't have time to do what we may have to do. All-of-a-sudden a car may dash out of a side street, and we want to be sure we can keep our car and that car from being in the same place at the same time. And we don't want to have to stop so fast that cars behind us pile into each other for perhaps a block back.



Now just as we need a safety margin ahead, we also need to protect ourselves from behind. For instance, many drivers tell us that when they want to turn or stop, they know that merely making the proper signal isn't enough. They make it a rule to start at least two blocks beforehand, getting into the right position to stop or turn.

If somebody behind sees them gradually working over to the right, for example, why, he naturally figures that they're either going to turn or stop. So he gives them a wide berth, to keep out of trouble. And when he does, then he keeps them out of trouble, too.



Along with these things, it's surprising how few of us are able to park our cars close to the curb in a limited space without a lot of extra turns. And it is true that expert parking can come only through experience, but like everything else there are certain simple rules or principles which, if clearly fixed in one's mind, will enable him or her to gain that experience and become expert with the least amount of effort, trouble and false moves.

STEP 1
Drive up in a straight line and stop even with and fairly close to the car in front.

STEP 2
Turn the wheels sharply and back the rear end of your car in toward the curb.

STEP 3
Swing the front wheels so as to bring front of car near curb.

STEP 4
Now pull yourself ahead into parking position.

By following the procedure outlined herein you should, after a little practice, be able to park your car in a space only a few feet longer than the car itself.

We may all know these things, but we know them so well we're apt to get careless about them. Because we can drive almost automatically, and hardly have to even think about it, we're apt to go rolling along thinking of something else. Then, all at once our eyes have an important message for our brain, and when they try to get the message through, the line is busy!

So it doesn't pay to let our thoughts go wool-gathering. As a matter of fact, it makes city driving just one emergency after another, which takes all the pleasure out of it. And there is pleasure in city driving when we know we're doing a skillful job, keeping the proper margins of time and space.

IX. COUNTRY DRIVING

IN DISCUSSING BRAKES we spoke of our cars as transportation systems . . . our own private railroads, so to speak, with home for our terminal.

As a rule we engineers behind the steering wheel work only on local runs . . . back and forth from the office, stores, and the rest of our regular stops. But every now and then, and especially when vacation time rolls around, we're likely to want to change our run. And one fine day there we are, out on the main line, at the throttle of our "Overland Limited," if you please.

Railroads put only their best engineers on important runs like that.

What the railroad men mean by the best engineer, is the one who has taken his train out and brought it in, time after time, year after year, without a thing to regret. Now there's one thing about this engineer that explains his good record better than anything else. He believes in signs. All along the way there are signals that tell him what to do, and he does exactly what they say. When a semaphore says slow down, he slows down. Whenever he gets the sign of a curve or grade, he adjusts his speed accordingly. Every red and green and amber light that comes winking through the darkness means a definite order that he'd never dream of ignoring. And when a flare warns him of danger, he just stops until he gets the go-ahead. Now, when we pull out of our station and on to the main track, if we are good engineers we'll take good heed of our signals as they come flashing by—"Curve," "Steep Hill," red light—"Stop." But along comes one that says "Intersection," and there doesn't happen to be any car passing on that other road. Or one that says "School, go slow," and there aren't any children about. Or "Slippery when wet," but today the road is dry. And what's the result? Why, a good many of us get to taking those signals with a grain of salt, and, after a while with so much salt that if we aren't careful those warnings may lose their meaning. It isn't hard to imagine what would happen if the railroad engineer got into that habit. He wouldn't be an engineer very long. No matter how many times his warnings prove unnecessary, he still goes on accepting them as gospel truth. And people who drive thousands of miles

every year tell us they have trained themselves to the very same habits as the engineers. We can just as easily form one habit as the other, and it pays to form the habit of automatically acting on the advice of our roadside signs.

And another thing that pays is to give our own signals to let other drivers know what we're going to do. Of course they don't have exactly the same signal systems in all localities. But if we point straight out to the left whenever we're going to make a left turn, rotate our left arm to indicate a right turn and point down to the road to signal for a stop, we're apt to get along all right wherever we drive. The best thing of course is to learn the accepted signals wherever we may be driving . . . but the main thing is to be sure to signal—and to signal plainly and in plenty of time.

So it isn't enough just to have our engine in good shape, and to watch our fuel and oil, or even to follow the rule of not driving too many hours at a stretch. Those things are highly important, but it is just as important to give our signals and to watch our signs and follow them religiously. Then we can look forward to sending back that ever-welcome message—"Arrived safe after pleasant trip."

MILESTONES OF PROGRESS

THE EFFICIENCY and safety of an automobile may be, in the long run, pretty much up to its owner, depending on how well he keeps it and how well he drives it. But just the same, a great deal also depends on how it was designed and built in the first place, and no manufacturer can overlook that responsibility. As a matter of fact, the development of the motor car, from its crude beginning to its present form, gives ample evidence that the manufacturer's part has not been overlooked.

There is no better example of continuous progress in performance, economy, comfort and safety than the following partial list of General Motors' own contributions along these lines:

CLOSED BODIES for commercial production—All-year motoring made practical.

THE SELF-STARTER—Made motoring not only easier but also safer, by eliminating the accidents, often serious, connected with cranking.

TILT-BEAM HEADLIGHTS—Greatly reduced the difficulties and hazards of night driving.

FOUR-WHEEL BRAKES for quantity produced perfection. More than doubled brake ability. One of the greatest contributions to motoring safety.

DUCO LACQUER FINISHES—Outstanding achievement in providing a more beautiful and more durable finish, and in reducing costs and prices.

CRANKCASE VENTILATION—Possibly the greatest single stride forward in engine durability.

SYNCRO-MESH TRANSMISSION—Commonly thought of as a provision for easier and more pleasant driving, this development is also important for increasing the assurance of getting into gear when traffic situations, hills and other road conditions demand a change of gears.

SUPER-SAFE HEADLIGHTS—generally known as "Multi-Beam," these headlights have introduced such efficiency and adaptability as to make night driving, especially on highways, immeasurably safer. (Safety for the car equipped, and for other drivers, too.)

FISHER NO DRAFT VENTILATION—Increases passenger comfort and protects passenger health.

KNEE-ACTION WHEELS—A great comfort factor which also adds to safety—by reducing fatigue, increasing ability to hold the road, and making steering easier.

TURRET-TOP BODIES—Solid steel protection by rattle-proof one-piece construction; cool in summer, and warm in winter.

Now the truth is that while these are some of the better known and more spectacular achievements, even they fall far short of telling the whole story. As a matter of fact, some of the most important developments have been of such nature as to appear unimpressive to the layman. But engineers will cite them as of outstanding value.

Development of stronger, more durable metals; new methods of lubrication; scientific load distribution; things like these . . . often presenting no hint of their existence to the eye . . . have done more than can ever be estimated to increase the performance, the economy, the comfort and the safety of automobiles.

It is satisfying to note as we review these developments that, while some have accomplished one thing, some another, in case after case they have provided a new measure of safety.

For that is the quality which, above all others, we drivers naturally value.

GM
GENERAL MOTORS

CHEVROLET • PONTIAC • OLDSMOBILE

BUICK • LaSALLE • CADILLAC

BODIES BY FISHER

GENERAL MOTORS
INSTALMENT PLAN

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