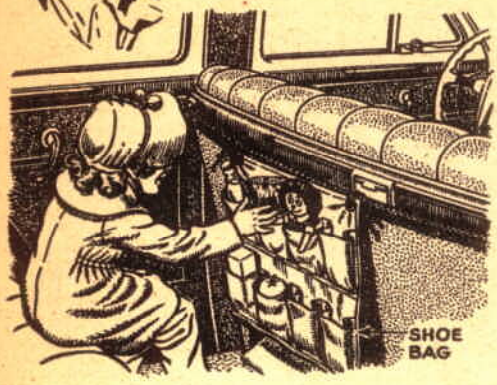
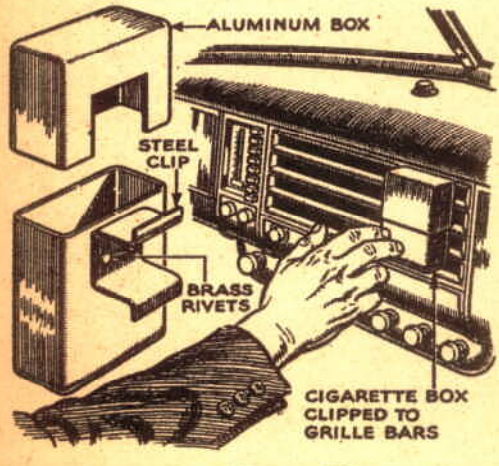
Hints from the Model Garage

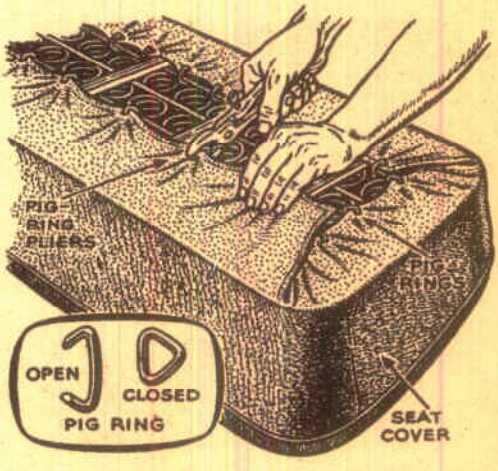


Shoe Bag Stores Toys. Before starting out on a long trip with a child, fasten a shoe bag to the back of the front seat. You can then stow toys, fruit, cookies, tissues, and other travel needs in the pockets. Besides keeping the inside of the car tidy, it saves packing and unpacking a suitcase en route.

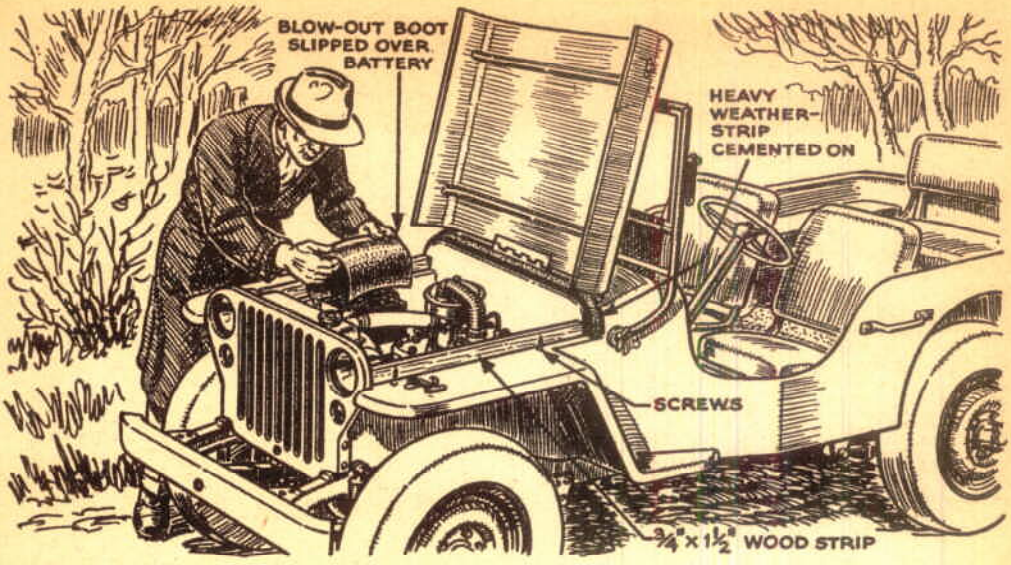
Eraser Cleans Windshield. George A. Smith, of Quarryville, Pa., suggests that a clean blackboard eraser is a handy item to carry in your glove compartment. When moisture collects on the inside of the windshield, a few strokes with the eraser will quickly give you unobstructed vision.



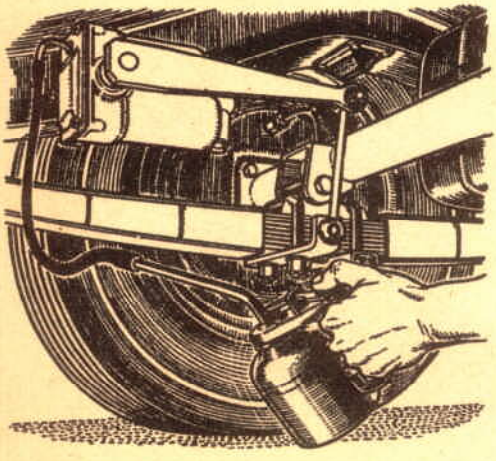
Cigarettes at Your Fingertips. Here's how Claude Wiseman, Jr., of Elizabethtown, Ky., mounted an aluminum pocket cigarette case on the radio grille of his car. A clip, bent from fairly heavy sheet steel, was riveted to one side of the body of the box and the cover notched to slip down over the clip. The clip is snapped between the grille bars. For a grille with vertical bars, the clip could be rotated 90 deg.



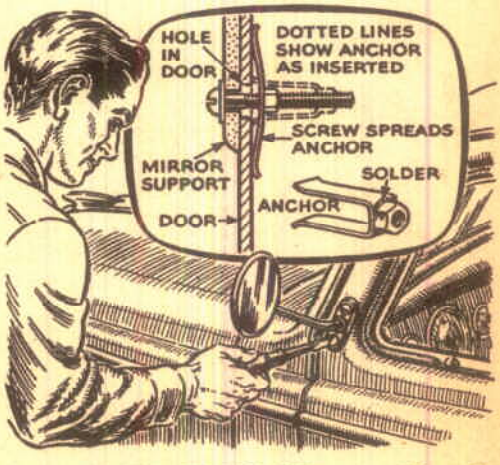
Pig Rings Fasten Seat Cover. There are many ways that you might attach seat covers to keep them from wrinkling, but C. F. Bigwood, of Malta, Mont., comes up with one that looks especially convenient for motorists who live in rural areas. He recommends the use of pig rings to clip the cover to the springs. With a pair of hog pliers, a handful of rings can be quickly locked in place around the edge of the cover.



Jeep Engine Kept Dry. David Horvath, of Yonkers, N. Y., writes that he frequently had trouble starting his Jeep because water and snow collected around the spark plugs and on the battery and wiring. This sketch shows how he waterproofed the engine for less than 75 cents. The openings between the hood and mud guards were closed with ¾" by 1½" wood strips, fastened to the mud guards with wood screws. A length of weather strip diverts water flowing from the cowl. A blow-out boot protects the battery.

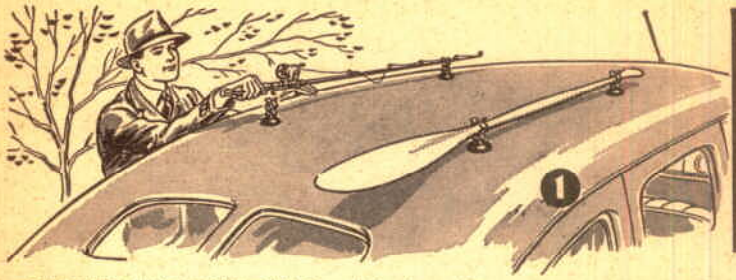


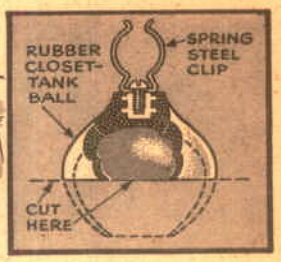
Shocks Filled with Oil Can. Here's a rig that will enable you to refill shock absorbers without difficulty when the filler plug is located in a hard-to-reach spot. Suggested by Marion L. Rhodes, of Knightstown, Ind., it consists of a pump-type oil can, a length of rubber tubing, and a small nozzle bent from copper tubing. With the nozzle inserted, a few strokes on the pump handle will quickly refill the shock.



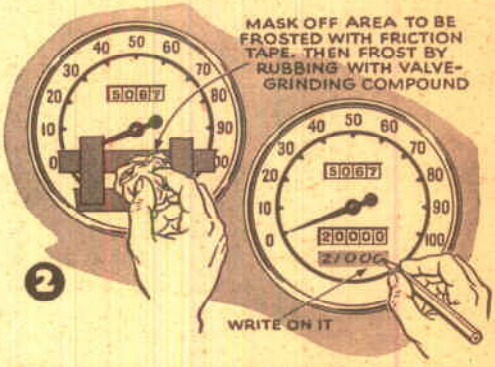
Toggle Nut Holds Mirror. When the original self-threading metal screw tore loose, B. Leo DeMare, of Aberdeen, Md., devised the nut shown above to fasten a rear-view mirror to his car. A nut first was filed down slightly to clear a hole in the door frame. A strip of sheet brass was drilled, soldered to the nut and bent into a U. The nut and anchor were threaded on the bolt, inserted in the hole, and drawn up tight.

USEFUL AUTO HINTS

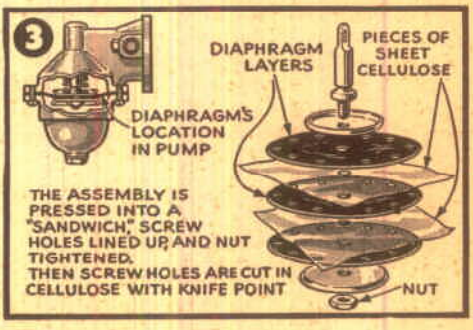




1 RUBBER VACUUM CUPS with strength enough to hold light articles on top of your car can be made from discarded flush balls that your plumber may be glad to save for you. There should be no puncture in the upper part. Cut off the balls about ⅛" below the halfway mark and face the edge on a rough emery wheel. Affix a spring clip to each threaded top.

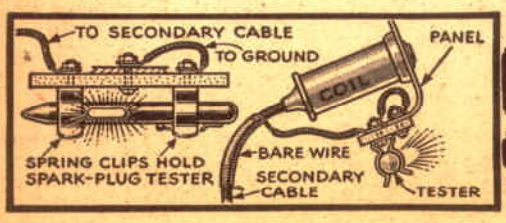


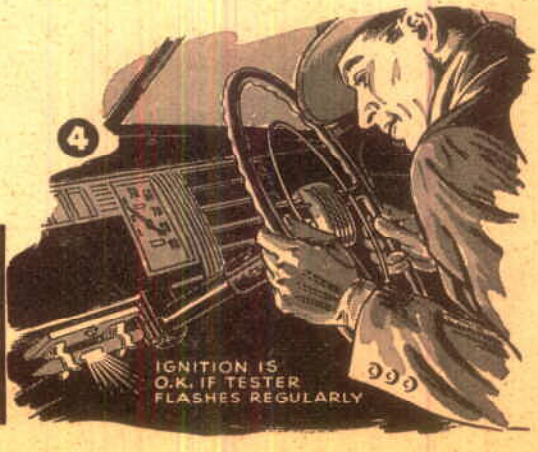
2 FOR A CONSTANT REMINDER of when to change oil or rotate tires, frost a strip on the speedometer glass to take penciled memoranda, which can be erased or washed off when desired. One way to frost the glass is to mask an area with tape and rub with valve-grinding compound.



3 EMERGENCY REPAIR to a fuel-pump diaphragm is possible with the transparent cellulose wrappings from a candy bar, loaf of bread, or the like. Sandwich a sheet between each two adjoining diaphragm layers, trim the edges, and punch screw holes; then replace the assembly.

4 CHECKING ON SPARK PLUGS is continuous with an electrically wired holder for a neon-type tester mounted within sight under the dashboard. Remove 12" of insulation from a length of wire, wrap it around the secondary cable, tape it over, and connect the other end of the wire to one holding clip. Ground the other terminal. Make the base of some insulating material. The tester will light by induction.





Is Your Car Wasting Gas?

An Ordinary Vacuum Gauge, Used for Easy Tune-Up Tests, Will Aid in Getting the Best Fuel Mileage Your Auto Can Give

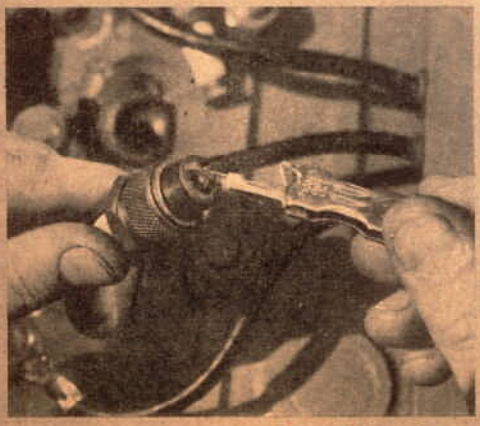
DESPITE the incentive of utilizing all gasoline, not one car in a hundred is kept in condition to give the fuel mileage that it might. Naturally, no exact figures exist, but many auto-servicing experts feel that the average car does not give more than 80 percent of its potential gasoline mileage. In other words, if your car is typical and if you're now getting about 16 miles per gallon, you're wasting four miles of travel for every gallon you buy—because you *could* get 20.

In a campaign to get more from the gasoline you buy, you'll probably find that it is the sum of a number of adjustments, rather than any single improvement, that will pay off. Your engine should be the first field of action in this campaign, because that is where your gasoline is spent and where the biggest gas-robbers usually lurk. A vacuum gauge will be found extremely useful in correcting engine faults and in tuning it up to peak efficiency. This gauge, which may be the same as those found on many vacuum-steam domestic furnaces, can ordinarily be purchased at plumbers' supply houses for less than $2. Be sure that the gauge has a scale reading from zero to 30" of vacuum.

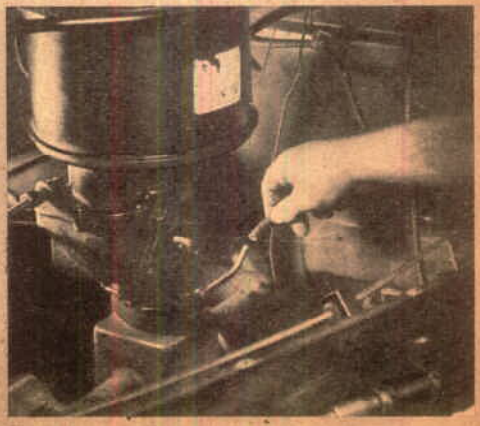
Spark plugs. First step will be to examine the plugs, perhaps the most crucial single part of a gasoline engine. Make sure that they are of the correct heat range for the engine in which they are installed, referring if necessary to the auto or plug manufacturers' specifications. If the plugs have been operated for some time without servicing, the chances are that you'll find an excessive gap between the electrodes, so clean them and set to the gap specified by the manufacturer.

It's also possible to test the plugs in the engine by shorting them out with a screwdriver having a well-insulated handle. Much can be determined about the condition of the plug by slowly drawing the grounded screwdriver away from the plug terminal and noting how far the spark will jump. A spark that jumps about the thickness of a nickel indicates that the plug is working satisfactorily; while one that won't jump more than .020" usually indicates a fouled plug. If on the other hand the spark will

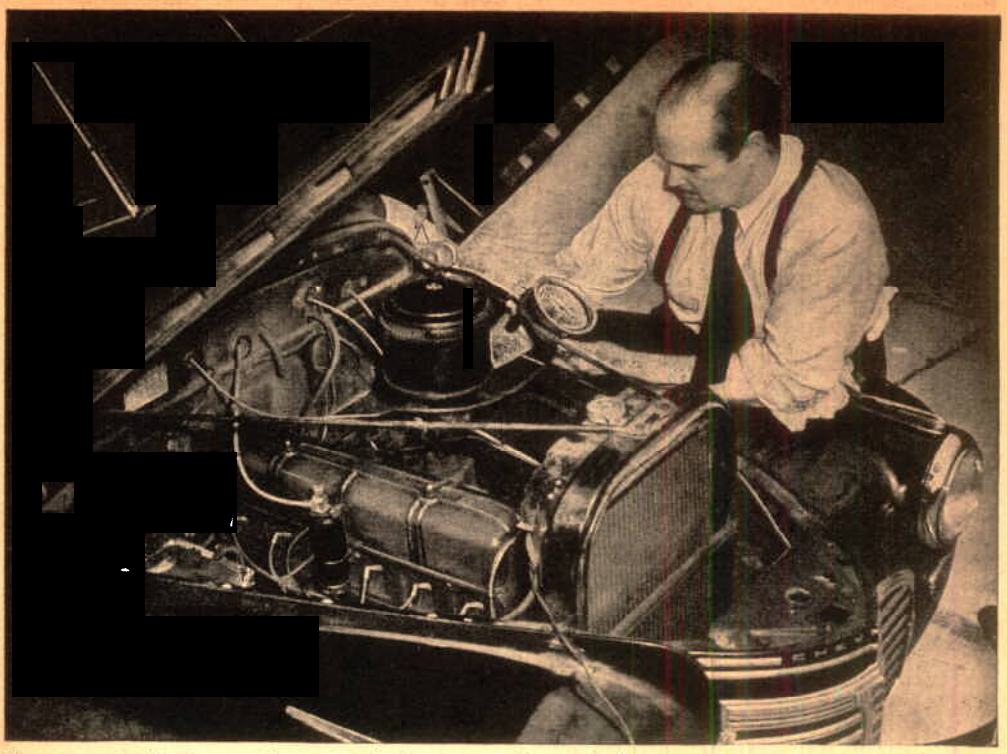
Make sure that the spark plugs in your car have the proper heat range for the engine, that they are reasonably free of carbon deposits, and that the gap is correct. If you cannot obtain the car manufacturer's specifications, use a gap of .025"



Probably the most convenient spot to connect the vacuum gauge used in the tune-up is at the place where the windshield-wiper line joins the intake manifold. Pull off the rubber hose that leads to the wiper and attach the gauge hose in its place



Courtesy The Texas Co.

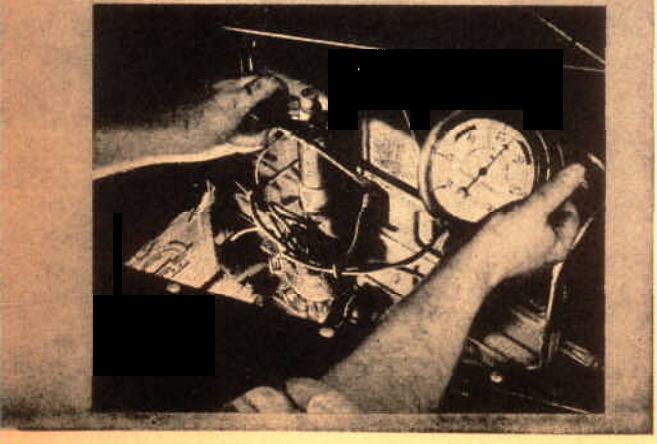


The gauge used to tune up the engine is the same as those installed on vacuum-steam domestic furnaces

jump around ¼" or more, the gap is far too wide, since the spark "prefers" to jump to the screwdriver instead of across the electrodes.

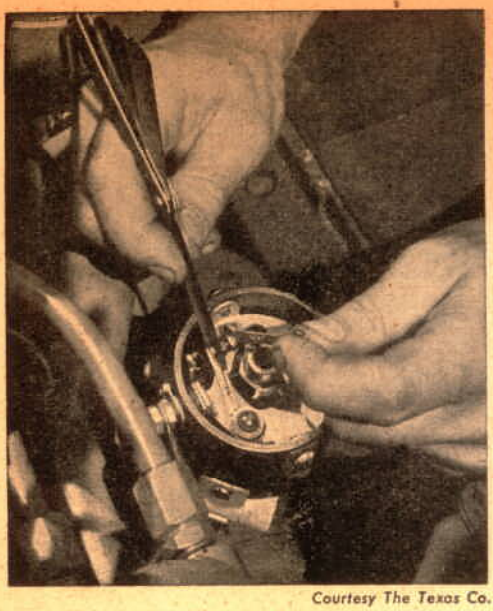
The next step in tuning up the engine is to connect the vacuum gauge to the intake manifold. On most cars the windshield-wiper pipe is tapped into the manifold and the gauge can readily be attached by pulling off the wiper hose and replacing it with the gauge hose. If the engine is in average condition, the gauge will show between 18" and 21" of vacuum at idling speed. Bear in mind that the higher this vacuum can be raised on any given throttle setting, the more efficient the engine will be. In most of the following tests, an extremely accurate tachometer would do as well.

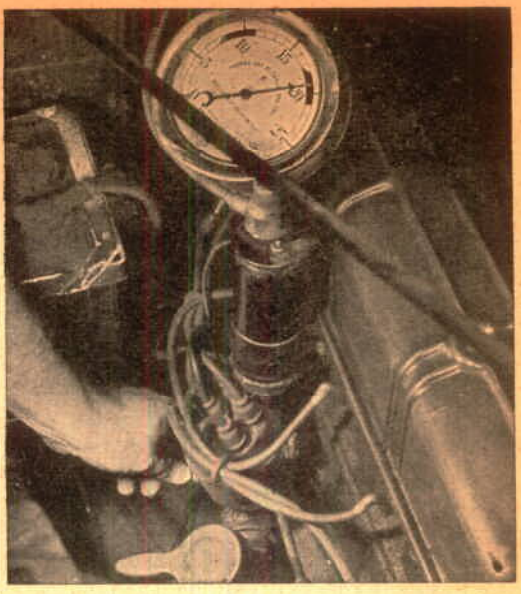
One ingenious use of a vacuum gauge is in diagnosing burned or sticking valves. Defective valve action of this nature will show a comparative vacuum drop every time the affected cylinder fires. By shorting a plug at a time, you can thus find where the trouble lies



Timing. Spark timing can be adjusted with hairsbreadth accuracy by means of the vacuum gauge, provided the distributor points are set correctly. Here's how to do it:

The gauge pointer will rise and drop as you advance and retard the timing. Retarding will cause a comparatively smooth drop, whereas advancing will bring a rather erratic drop. First, retard the distributor slightly until you can see the retarding effect on the gauge, and then advance the distributor slowly until the maximum obtainable rise in vacuum has been achieved. When this point has been reached, the advance can be continued for several degrees without changing the reading, indicating that the firing position is at top dead center. Now retard the dis-





Courtesy The Texas Co.

Distributor points should be examined periodically for excessive pitting, and dressed by means of a point file. Use a feeler gauge in setting the gap

With this vacuum gauge, the timing can be adjusted very easily. The distributor should be advanced or retarded until the gauge shows the highest reading

tributor very slowly to a point where the hand is just about to show a retarding drop, and lock it in this position.

If the operation is done with care, you will find that practically perfect timing results. The writer has timed scores of engines, using timing lights, top dead center finders, and other instruments for the purpose. Timing by vacuum gauge is not only quite as accurate, but it also takes a small fraction of the time required by other methods. It is important, however, to remember that the distributor points must be set properly before timing is attempted.

An automatic spark-advance mechanism, either of the vacuum or mechanical type, may also be tested. This should be done after the timing is correctly set at idling speed. Open the throttle approximately three-quarters of the way and again advance and retard the timing setting. If you can increase the vacuum indicated, the automatic advance mechanism is not operating properly, for it should maintain the correct timing over the complete range from idling to full throttle.

Distributor. Since it's the nerve center of a gasoline engine, the distributor is often the cause of off-peak performance. Here are a series of quick checks you can make to be sure it is not wasting your gasoline.

First, remove the cap and examine the inside of it. If the cap is shorting, there may be bluish-gray traces left on the surface, or tiny cracks near the electrodes. A cap in this condition should be replaced, for it will cause poor performance and make starting in damp weather extremely difficult.

Next examine the condition of the points. If either the stationary or moving points show substantial pits or deposits, the condenser and its connections should come under immediate suspicion. Points in good condition will be gray in color and can be readily cleaned with a point file.

A condition which very few mechanics will think to check, but which can be extremely important, is a weakened point spring. This will result in poor performance and even missing at high speeds. In the writer's opinion, it is something that has caused more unnecessary changing of carburetors, coils, and condensers than any other single motor ailment. If it's inconvenient to have the spring tested in a service station, borrow or purchase a point-spring scale, obtainable from several manufacturers for about $1.50, and see if it has the minimum tension required for proper operation. The correct tension can be learned from a service station dealing in your make of distributor.

Distributor experts can often check the point gap with exceptional accuracy without looking at the points, for their trained eyes can tell at a glance what the gap must be by the shiny section on the cam. Since the cam opens and shuts the points by bearing against the fiber on the breaker arm, the part of the cam which touches the fiber will be shiny and the part which does not touch will be dull. In most distributors, if two-thirds of the cam area is dull and one-third is shiny, the point setting will be approximately correct. However, unless you are very familiar with the way your cam

should look, don't rely on this check, but instead use a feeler gauge in setting the points to the manufacturer's specifications.

Carburetor. It is possible to make sensitive carburetor adjustments with the vacuum gauge. You'll notice that as the mixture adjustments are changed, the vacuum reading rises and falls. The highest reading obtainable on a fixed throttle setting will be the correct setting. If your carburetor has separate idling and high-speed adjustments, place the throttle in the appropriate speed range before making the adjustments.

Many autoists have labored under the notion that a carburetor adjusted for top performance will not be economical, and that one set for maximum economy will not give full power and speed. This is not entirely correct; a properly adjusted carburetor will produce both good performance and good economy.

Fuel Pump. If you suspect that your fuel pump does not deliver sufficient gasoline at high speeds, test it by means of the vacuum gauge. Disconnect the intake pipe and attach the vacuum-gauge hose to the pump; then run the motor at idling speed by means of the gasoline already in the carburetor. The pump should show from 5" to 11" of vacuum. If it doesn't, it should be removed, dismantled, and inspected for faults.

Valves. Burned or sticking exhaust valves will be indicated on the vacuum gauge by a drop of 2" or 3" every time a cylinder with a defective valve fires. By shorting out one cylinder at a time you can locate the bad valve; when its cylinder is shorted out, the pointer will stop its erratic dips.

Compression. Poor compression can be located in the same manner. If difficulty of this sort is suspected, start shorting out one cylinder at a time and note the drop in vacuum caused by each inoperative cylinder. Let's assume that five of the cylinders in a six-cylinder engine cause drops ranging from 1½" to 2", while one cylinder brings a drop of only 1". You may be sure that the latter cylinder is the weak one, with poor compression caused by bad rings or valves. If the test shows fairly uniform drops for all cylinders, compression trouble can usually be ruled out.

With practice you will find that you can even make what doctors call a "differential diagnosis"—that is, you can tell with fair accuracy whether trouble of this nature lies in valves or rings. Compression loss resulting from bad valves is generally shown by a larger drop and by erratic behavior of the pointer, whereas ring trouble is characterized by a lesser and more regular drop.

Aside from the engine there are auto ailments elsewhere that can steal from the true value of your gasoline supply. One of them, not often recognized at its real importance, is underinflations of tires. To visualize how much this can mean, remember your bicycling days—how hard it was to pedal when the tires were low, and how much easier it became when you pumped them up. Actually, inflation of tires to a pressure from two to 10 lbs. above manufacturers' specification increases mileage.

Four other potential fuel wasters should also be considered. Unnecessarily heavy lubricants in the transmission or rear end, dragging brakes, misaligned front wheels, and careless driving habits—which include jack-rabbit starts and overuse of the gear-shift lever and choke—are capable of making a deep cut in the gasoline mileage that your car *can* give.

Mixture controls on the carburetor are turned carefully until the hand on the vacuum gauge is as high as possible. A high-speed jet can be adjusted only if the engine is turning at a good speed

Driving 30 miles an hour is as dangerous as driving on the roof of a high building! If you hit another car head on going at the same "safe" speed, it would be like driving off a nine-story building.

Good Driving Is a Habit

...How to teach your family the Seven Keys to Safety

By Devon Francis and John F. Stearns

THE driver of a suburban bus outside Detroit was rolling along at a moderate rate the other day when suddenly he hauled on the wheel and swerved. The maneuver was puzzling. Except for some snow-covered cars parked by the right-hand curb, the road was clear.

As I stepped off the bus I asked him about it.

"Oh, that!" he replied. "Well, as we came up to that line of parked cars, I saw the snow on the hood of one of them begin to slide off. I figured his engine was running and maybe he was getting ready to pull away from the curb. I wasn't taking any chances."

That bus driver was a good driver. He made good driving a habit. He knew he had to. It's no longer possible to make each move in driving a conscious move. Speeds have become too fast for that. Stopping distances are too great. Safety on the highway demands practice until the proper reaction in an emergency becomes automatic.

The first thing to teach your family about the operation of the family car is that good driving must be habitual. Good driving includes keeping a constant lookout for what the other fellow is going to do.

Slip into the right-hand front seat of the family jalopy and have your student settle himself comfortably behind the wheel. We'll assume that he knows the rudiments—how to depress the clutch, shift, brake, and steer. Knowing how to manipulate the controls is the least of knowing how to drive. Now let's take it from there.

Pulling from the Curb

Make your student keep his clutch depressed until he has looked backward out of the window and forward up the street for other cars. Don't let him rely on his rear view mirror. It only shows about three-fourths of the road. Explain that to him. You know that, but he doesn't. And watch out for pedestrians, too. Stick out that hand. Other motorists must know what

your car is going to do *before* it does it. It's too late after the crash. Ease out, now, in low. Shift carefully, accelerate slowly.

Make your student develop the habit of driving ahead of himself. Say to him, "Imagine you're sitting on the front bumper. You'd keep looking ahead to see what was coming, wouldn't you?" There's a car at the curb. Its exhaust pipe spits a puff of smoke. The engine must be running. Its driver may pull into the street. Ease by, watchful. There's another car parked just ahead of it. Its front wheels are turned out. Is it going to pull away from the curb?

A kid's ball bounces into the street. Use the brake. Don't wait to see if a kid follows. Take that for granted. Slow down.

"Rule Number One at intersections," you tell your student, "is that a yellow light means slow down. No light at all means slow down. A green light means slow down. At intersections just slow down! It's healthier. Look left first, since the line of cars you'll meet first will be coming from the left. Make it a habit.

"Watch every other car in the intersection and every car that can reach the intersection before you leave it. Some dope in a hot rod may come screeching through. Look at that line of cars to the right now. If one of them tries to pass another one inside the intersection, put out your hand and stop. Let the fool get out of the way before you move. And in stopping, don't jam on the brake. The car behind you may smack into your rear end. That could well-nigh break your neck."

Tell your student to make it a habit to keep his eye peeled for clues to what the other fellow is going to do. Front wheels on the roll telegraph a lot of information. The car coming into the intersection just opposite you is slowing. Its wheels turn just a shade. Its driver is going to make a turn. Easy, that may mean a full stop for you to let him get out of the way.

Stop for a Talk

When you get through the intersection have your student pull over to the curb for a talk. How fast was he going as he approached the intersection? Twenty. That sounds safe. But does he have any idea how far his car would travel in a half-second at 20 miles an hour? The answer is *fourteen feet*. And what's the half-second for? Well, that's how long it would take him to react to an emergency. Fourteen feet can be the difference between safety and collision.

A moment ago you warned him against drivers who tried to pass within the intersection. Why? Well, supposing he himself tried to pass another car that had slowed down. The other car may have slowed down to let a pedestrian cross in front of him. Could *he* avoid the pedestrian? Or the other driver may have been looking for a cross street. If he found it, the chances are he would swing hard left. How much chance would he have to avoid a collision? Or the other driver may have spotted a car on the cross street coming in fast. If your student had been passing, would he have been able to stop in time?

Try another intersection. Here, a streetcar going in the same direction stops as you

This was the inevitable result of driving too fast *for conditions*. Up ahead, two cars collided. Nine other motorists couldn't stop in time. The cost: seven drivers were injured.

approach. Ask your student, "Know what may happen if you barge on into that intersection? Another car may come in fast on you from the left. The streetcar hides it. What'll the other driver do—go under you, over you, or through you? Get the habit: STOP."

Railroad tracks are intersections too. Roll your student up to a crossing. Where it says stop, it means STOP. Trains use wheels too, and anything on wheels is potentially dangerous. Single track or double track? Look both ways. The tail end of that passenger train rumbling by may hide the head end of a freight a hundred feet away. Wait. You may spend 30 seconds and save your life.

Turning

Practice making turns. Tell your student he must learn a habit of signaling. Make him learn to work his way into the proper lane minutes before he intends to make a turn. He must ease off on the accelerator several hundred feet ahead of his turn. He'll learn that the braking power of his engine compression with the power off is one of his chief assets in car control.

To make that turn he must signal. Say to your student, "put out your hand. For a right turn, you must be in the right lane. For a left turn, you must be in the left lane. That's elementary, but make it a habit. To change lanes you've got to signal. You've got to look behind you for following traffic. You've got to signal again for your actual turn. That's just protecting yourself from the other fellow."

Now for the turn. It's you talking: "Swing left just short of the center of the intersection, if the law permits. That leaves room for drivers coming from the opposite direction who also want to turn left. Complete your turn just to the right of the cross street's center line. See how this keeps the number of traffic lanes you have to cross at a minimum?"

Right turns are money in the bank. Start from the right lane. Complete the turn in the right lane.

Passing

Take your student out on the open road. Here's space. He's got a lot of horsepower under his foot and he aches to use it. If the road's clear, let him. It satisfies an urge.

He's going to overtake cars going his way that are jogging along uncomfortably slow. He wants to pass. What's a safe passing speed? What's a safe passing distance? Those are hard ones to answer. But maybe this will help.

If your student is going to pass a car going 40 m.p.h., he should have about 1,000 feet—or about 55 car lengths—between him and any car coming from the opposite direction before attempting it. And there's a catch. These conditions hold good if the oncoming car is making about 45. They hold good if the pavement is dry, if the road is straight and level. If the pavement isn't dry, tell him to double his estimate just for safety.

If there's a hill or a curve, tell him to make it a habit to let up on that accelerator and keep his position.

He makes an experimental pass. The car gets by all right, but he cuts in too sharply in his anxiety to get back into the right-hand lane. "Wait," you have to tell him, "until you can see some part of the car you've just passed appear in your rearview mirror. Then ease back into your lane."

There was something else. Did he forget something? He looks blank. Did he look behind before he started to pass to see what traffic was following him? Did he put out his hand? No, he didn't. Let those answers ride on the double zero for the next spin of the wheels without saying anything more. It's effective.

"At night," you can tell your student, "passing is more critical. Make it a habit to allow yourself more room. Be more critical of your judgment of speed. Flick your headlights to tip off the car ahead that you're going around him."

Speed

That speed itch is eating at the ball of your student's right foot. You know it. The needle on the speedometer keeps creeping up. Let him go. Wait until she hits 50. Then tell him to brake to a stop as fast as he can and still keep the car under control.

He starts braking. "Did you look behind?" you ask him. "Did you put out your hand in a slow signal?" No, he didn't. Okay, just a reminder to make it a habit.

As the car snubs to a halt, ask him if he has any idea how much distance he ate up in stopping the car. No, he hasn't. Then explain it to him: "It took you a total of almost a full city block to bring this jalopy to a stop from 50 miles an hour. But there's something even more important—do you know how far your car traveled from the

time I told you to stop until your brakes began taking hold? No? Well, it was 55 feet, more than the width of a city lot. It took you that long to react."

It will help that itchy accelerator foot if he forms the habit of thinking of a car as a huge steel flywheel. The faster it goes, the more kinetic energy it builds up. The kinetic energy goes up as the *square* of the speed. *It's 25 times as great at 50 miles an hour as it is at 10.* The only way that kinetic energy can be dissipated fast is with the brakes.

And here's another valuable habit to form—have him keep thinking of driving conditions. The trouble with most drivers is that they go *too fast for conditions.* Visibility, for instance. There may be fog, rain, or snow. Ever hear of a pilot taking his personal plane off the ground when the airport was fogged in? Okay, take a cue from people who fly airplanes. Even 10 miles an hour may be too fast under certain conditions.

What's the condition of the road? Ice? Snow? Rain? What's the condition of traffic? Light? Heavy? What's the condition of the terrain? Hills? Hairpin curves? What's the condition of the car? Brakes okay? Headlights bright? What's *your* condition, Mr. Student? Sleepy? Worried and preoccupied?

Remember, teacher, you can't do your job in one lesson. You are trying to form a habit. So short, frequent sessions are best. And watch yourself: don't *you* get excited. Keep your voice deliberately low and calm.

As your pupil progresses, keep him at the wheel longer. Let him get confidence, but when he becomes over-confident, as he will, check him gently. Let him get away with two or three blunders. *Then* tell him.

That's enough for today. Tell your student to turn around and head for home. Whoops! How about a signal for that turn? Remember, make it a *habit!* END

Seven Keys to Safety

1
Learn to judge conditions: traffic, visibility, road surface, mechanical condition of cars, physical condition of drivers.

2
Don't forget that it isn't how fast you go, it's how fast you can stop. Stopping = braking distance + your reaction distance.

3
Keep one (1) car length behind the other fellow for every 10 miles on your speedometer. Double (× 2) it for wet days. Double that (× 4) for snow or ice.

4
Suspect every pedestrian of suicide.

5
Slow down at yellow lights. Slow down at no lights. Slow down at *green lights. Every intersection is a crash point.*

6
Signal *your* intentions. Protect yourself from the other fellow.

7
Expect the worst from the other fellow.

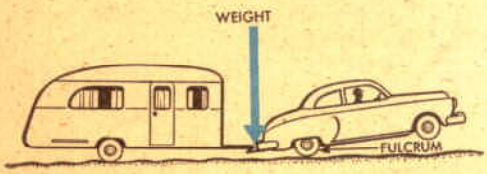
What You Should Know About

Towing a Trailer

By R. P. Stevenson

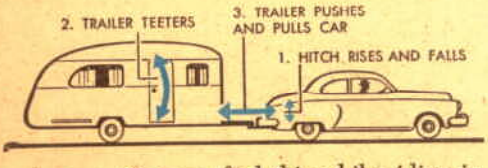
YOUR car was designed and built primarily to haul passengers, not to tow a heavy trailer coach. That it can and will do the towing job too is an extra dividend tossed in your lap. But as the car stands, it's not ready for the job. You must take up where the designers left off.

This would become plain enough if you were to install an ordinary bumper hitch, hook up a fair-sized trailer, and set off without further preparation. Here are some of the undesirable results you might observe:

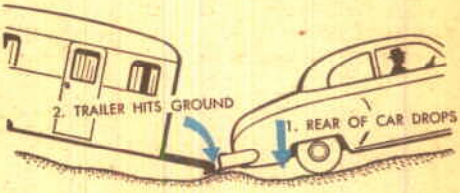


Leverage. Because a trailer imposes a portion of its weight on the end of a car, a cantilever would be set up—with the car's rear axle as the fulcrum. The extra weight could easily load the rear axle beyond the maximum for which it was designed. You might not notice such an overload at once—but you couldn't help seeing that the car's front end tends to rise as the trailer bears down on a bumpy road.

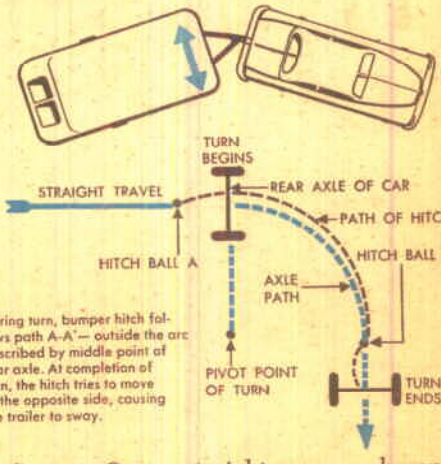
Because of the heavy strain, the car's springs may break, the frame twist, the axles bend, or the hitch snap.



Surge. You can feel this while riding in a tow car. It is a push-pull effect produced by the normal rising and falling of the bumper hitch. As this occurs, the trailer's center of balance shifts back and forth—that is, the trailer teeters endwise. Consequently, the tow bar alternately shoves and pulls back on the hitch ball. The hitch and car frame take a beating.

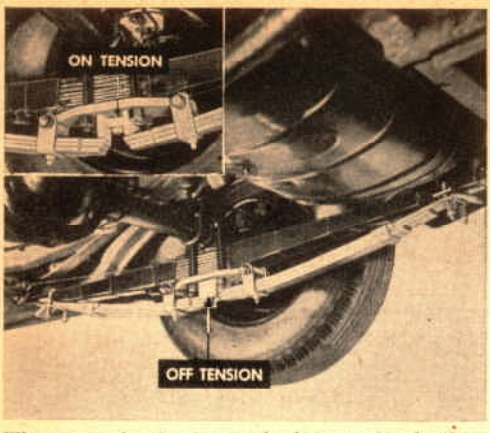


Nose-diving. This occurs when the rear wheels of the car have just dipped into the valley at the bottom of a steep ramp or service-station apron. The rear bumper sweeps low, causing the trailer nose to strike the pavement. Because of this, you may be unable to haul a trailer across a ditch.

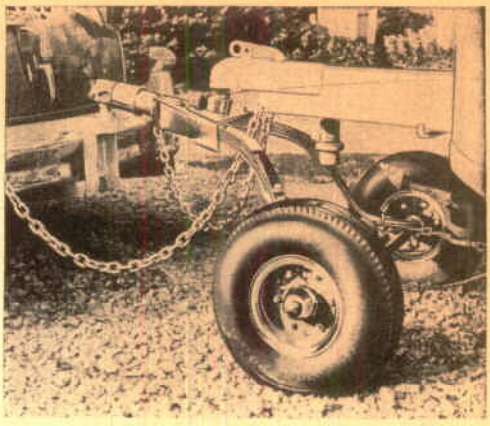


Sway. On a straightaway, a bumper hitch follows behind the center of the rear axle. As you begin a turn, the hitch swings outward—away from the direction of the turn. Momentarily, the hitch turns the trailer in the *wrong* direction.

Once headed the wrong way, the ➧



These overload springs don't cause hard riding after trailer is unhitched. Swiveling the H-shaped block removes or applies tension. The makers also offer releasable leaf-spring helpers for cars with coil springs. Another manufacturer sells helpers that adjust to suit the load.



Hitch the dolly to the car, the trailer to the dolly. That's the principle of this and several other dollies. The two hitch balls make the unit more flexible, reducing road shock both in car and trailer. Another type has one or more wheels under the trailer without a second hitch.

heavy trailer resists the pull of the hitch ball, and the tires and car frame take an extra load. When you come out of the turn, the hitch ball tends to swing in the opposite direction. This sets up a whip action, and the trailer begins to sway.

Should you make a sharp turn to avoid a road obstruction, sway can tip the trailer over. If the road is slippery, your unit may jacknife.

What you can do. Because of the forces at work, a sturdy hitch is a must. Hitches are available commercially for most cars, but you can have a special one made to order. Some are bolted or welded only to the rear cross member of the car frame. To spread the load, others have arms extending to the side frame. It is important to keep the hitch from shifting sideways. After the hitch is made, the tow bar should incline up toward the car instead of being left level.

To counteract leverage effects, some owners use overload, or helper, springs. But you should note that these merely keep the rear of the car from bottoming. They do not remove an overload from the frame, axle, and tires of the car.

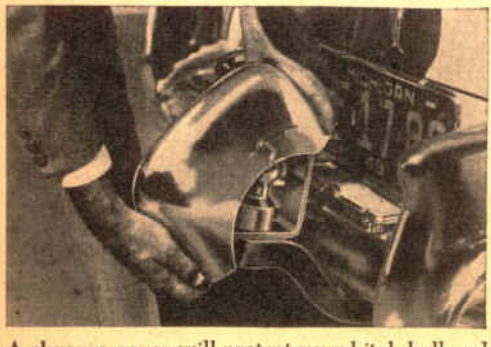
A dolly under the trailer will do this. Some dollies are designed to carry all the load, others only part. Overload springs can be combined with the latter. As a rule, some extra load should remain on the car. This improves traction.

A dolly also will lessen surge action by keeping the trailer on a more even keel. Overload springs will forestall nose-diving by preventing the hitch from going so far down. A dolly with a tow bar that's free to rise and fall with the bumper ball will also keep the trailer nose clear.

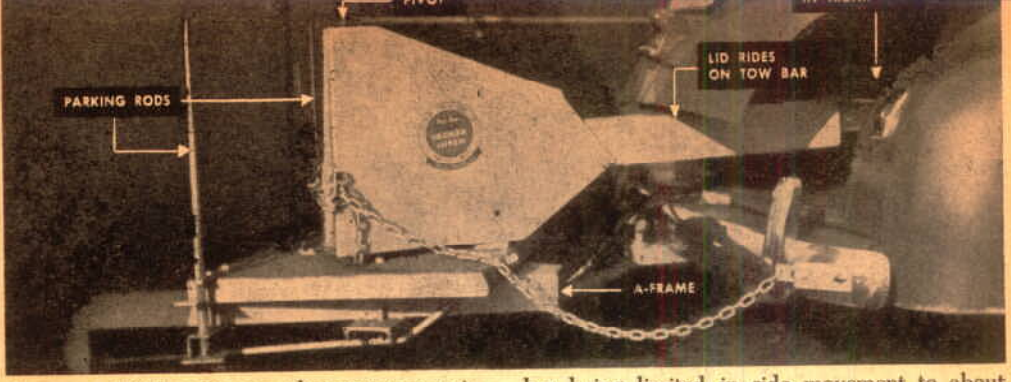
The possibility of sway is inherent in any bumper hitch. A dolly may help a little but will not prevent it. Your best protection is caution on turns.

Trailerites disagree on whether it's best to use helper springs alone, a dolly alone, or a combination of the two. A good case can be made for or against each method, depending largely on the particular equipment and whether it's installed and adjusted as the manufacturer recommends. If the trailer is small and well balanced, helper springs may get you by. For one of the big jobs, a dolly probably will be a must.

Avoid an overload. Every trailer has a certain hitch-ball weight. This may range



A chrome cover will protect your hitch ball and improve appearance of car. This one is made by John Hill Plating Co., Lansing, Mich.



Over-axle hitch now on market uses same principle as the fifth wheel of a trailer truck. Tow bar attaches to a pivoting hitch located in trunk above the car's axle. Entire tow bar also pivots at the trailer. On ordinary, slight road curves, the bar pivots only on hitch ball in trunk, the bar being limited in side movement to about five inches. On greater curves, tug of safety chain causes second pivot at rear to go into action. On straightaways, this is locked by two rollers that sit astride a cam. The maker claims open lid is no disadvantage.

from 200 to about 700 lb., depending on the trailer's size and balance.

At least one car maker (Buick) recommends that the rear-axle load be kept below 500 lb. This is probably a safe maximum in any car. If you are in doubt about the load, haul the trailer to a truck scale. Park the car on the scale and weigh it both with and without the trailer attached, keeping the trailer wheels off the scale. The difference is the rear-axle load. Do this after you have loaded the trailer for traveling. A few extra furnishings up front can produce a sharp increase in the ball weight. Your solution is to distribute the furnishings to keep the hitch weight from climbing.

Rear-tire pressures usually must be increased because of the extra load. Buick recommends 30 lb. at the rear, 24 at the front for its recent models. For more comfortable riding, deflate the tires to normal pressures after unhitching.

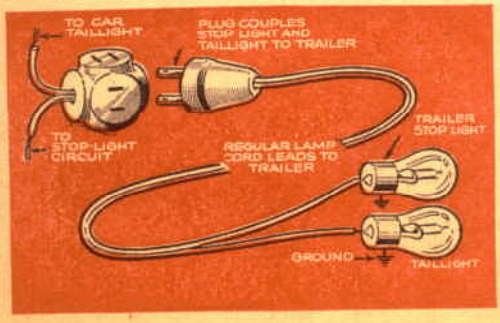
What about a fifth wheel? Trailer men have long realized that a hookup patterned after the big truck trailers would have advantages. Moving the hitch ball up to or ahead of the rear axle would reduce or eliminate many of the bumper-hitch faults. Obviously, this presents difficulties in a passenger car. However, you can buy several outfits that make the hitch under the axle—and at least one that goes over the axle. The latter is shown above.

Is an automatic transmission suitable for trailer towing? That's a question you'll want to know these days. The engineers have wondered too, and have made some test runs. Their answer:

Yes. Uphill, there's no lack of power. Downhill, the transmission can do a good braking job. And on starts, the engineers say, there's a positive advantage, for the oil cushion helps get both car and trailer under way easily and smoothly. END

One Plug Connects Two Lights

You can use household electrical supplies as below to connect a trailer tail and stop light to the tow car. Mark the plug and socket so you won't reverse the connections. You'll need a ground return if trailer and hitch aren't metal.



Stop Light from Coffee Can

An effective stop light for a trailer can be made as shown here. If you don't use the trailer a lot, you can probably get by without investing in a bulb socket. Just solder the bulb to the can and the hot wire. Use a 21-candlepower bulb.