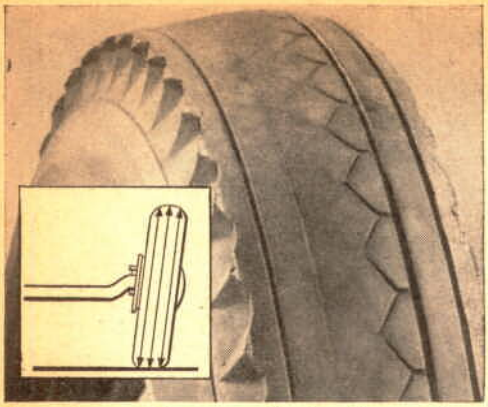
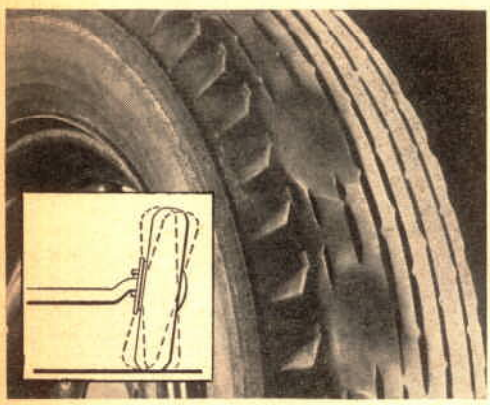


Excessive camber wears the tread away along the outer edge. When a tire shows wear like this, or as seen in the two photos below, an alignment job on your wheels is long overdue.



Wobbly wheels resulting from such mechanical defects as a bent axle or uneven caster soon make a tire look like this, flat spots being worn in the tread at irregular intervals.

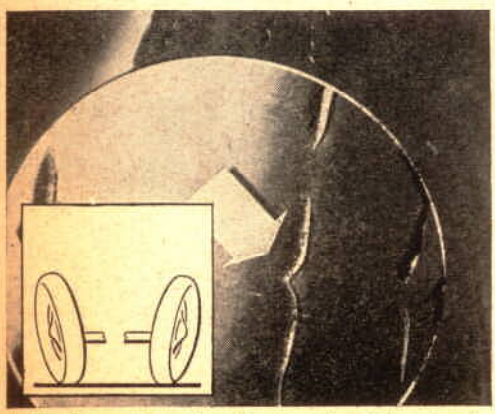
Most Flats Are Your Own Fault

By R. P. Stevenson

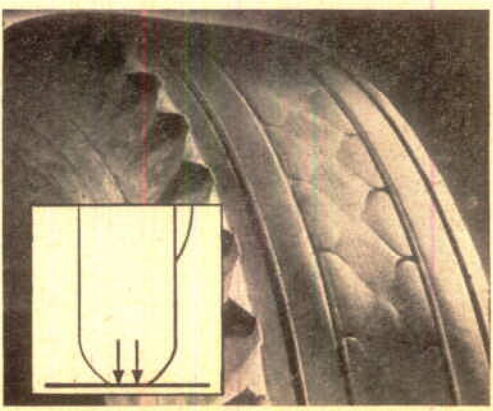
WHEN one of your tires goes suddenly flat along the highway, perhaps miles in the country on a dark and blustery night, it's a pretty safe bet that you might have detected the impending trouble and taken steps to prevent it. There's evidence to prove that some 90 percent of all such inconvenient tire failures can be avoided.

This doesn't mean you must scan every inch of the roadbed ahead for nails and tacks. Anyone is apt to puncture a tire now and then, and even the most careful driver occasionally bumps a rock or curb with sufficient force to break the fabric. Such damage almost invariably results in a flat. But —and this is a fact that drivers often fail to realize—complete failure may not come for days, and perhaps weeks. In the interval, there usually is ample opportunity to detect the symptoms of forthcoming failure and repair the tire before it hangs you up along the road.

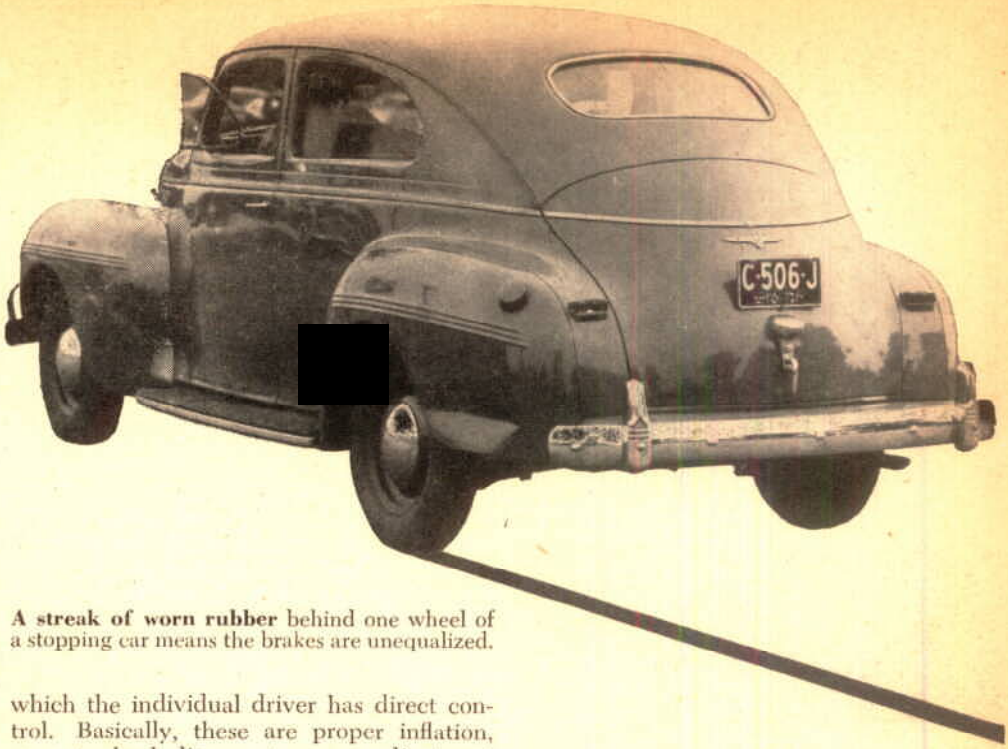
Tires are built to give their maximum mileage under operating conditions over



A feather edge of rubber on front-tire treads is a sign of wrong toe-in or toe-out. A wheel ½" out of alignment drags the tire sideways about 67′ every time the car travels a mile.



Overinflation wears the tread in the center, leaving the fringes in fairly good condition. Because of abnormal tension, such a tire also is more susceptible to cuts and tread breaks.



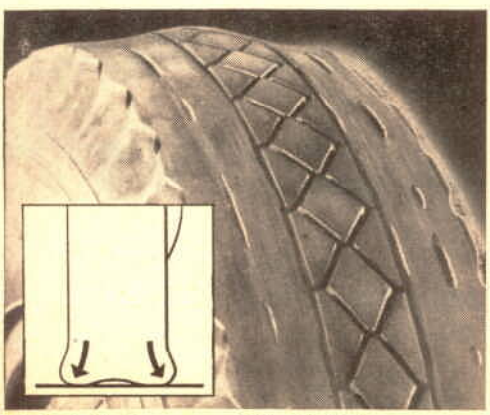
A streak of worn rubber behind one wheel of a stopping car means the brakes are unequalized.

which the individual driver has direct control. Basically, these are proper inflation, correct wheel alignment, proper adjustment and efficient use of brakes, and avoidance of damaging road obstacles. Carelessness about any of these points may quickly ruin a tire. Examples of such damage are illustrated on this and the preceding page.

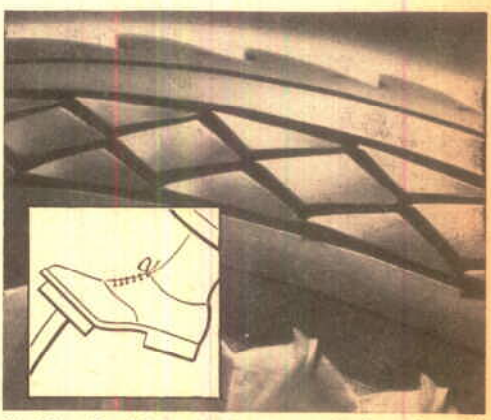
When a tire has been badly worn or damaged because of one of these reasons, it may of course go flat or blow out without warning. But suppose a comparatively new and apparently undamaged tire fails unexpectedly? What then?

In such cases, you may be sure that, barring a leaky valve or the slim chance of a manufacturing defect, the flat occurred because the tire, or maybe only the tube, was damaged in some way during operation—usually quite a while before the failure.

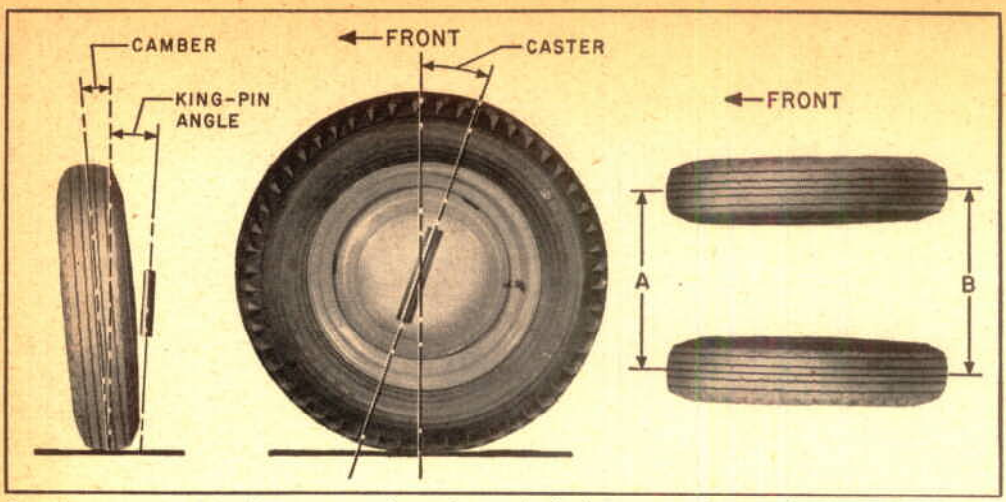
This fact may be turned to your ad-



Underinflation, especially if it is excessive, may have this unexpected result—heavy wear only on the shoulders. For the cost of underinflation, see the chart on the next page.



Sudden braking causes one end of each tread button to wear more than the other, heaviest wear occurring on the end that first contacts the road. This is known as heel-and-toe wear.



Steering geometry involves proper relationship of camber, caster, king-pin angle, and toe-in (which requires that *A* be less than *B*.) If any element is off, undue tire wear will result.

vantage. It is the basis of a method of preventive maintenance developed by A. Schrader's Son, of Brooklyn, N. Y., a division of the Scovill Manufacturing Company, Inc. Called the "Comparative Air-Loss System," this method of preventing tire failure emphasizes that any excess loss of pressure, as shown by regular gauging, should be regarded as a warning that the tire has been damaged and will eventually go flat.

The system embraces four points:

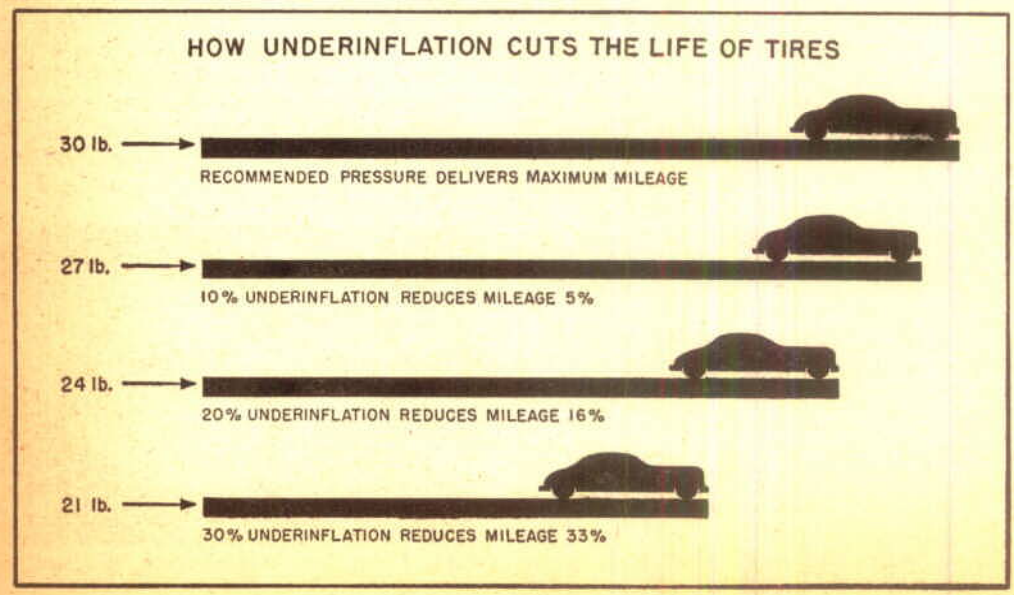
1. Gauging of tires when they are cool, once each week before adding air.

2. Recording and careful comparison of the pressures. If the pressure of one tire is 3 lb. below its running mate, there probably is a leak in the tube, and the cause should be immediately determined.

3. Keeping a valve cap firmly applied at all times, not only to prevent air loss in case the valve is faulty but also to restrict any source of leakage to the tube.

4. Removal of foreign objects from the tire surface when the car is lubricated.

Originated during the war as a tire conservation measure, the system was featured



Warning of a flat tire is contained in this record. The excess pressure loss in the right front tire indicates a slow leak. If a flat is to be avoided, this tire should be checked at once.

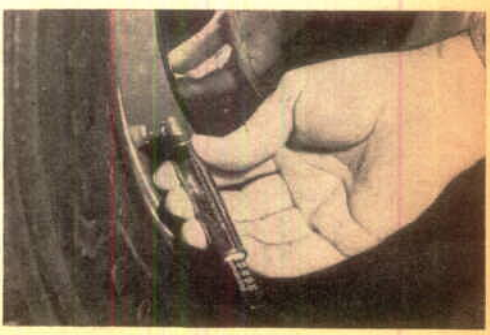
in a bulletin distributed to branches of the armed forces and to bus and truck fleet operators. That it produces results is shown by the experience of one company operating a fleet of trucks. Before adopting the system, the company had an average of three flats a day. Subsequently, the same trucks ran for six months and one day, a total of 236,000 miles, before the first roadside flat occurred.

The system can be applied to passenger cars with equal results, and a test on a 1946 model, reported by the Schrader company, shows why. At the beginning of the test, the car still had the original tires and tubes and already had run 11,284 miles. While cool, the tires were inflated to 28 lb. Then, 20 nails were deliberately driven into the four tires, and the car was started out on a test run at above average speed. At the end of five days, the tires were reinflated to 28 lb., after first being gauged. At that time, despite the presence of the 20 nails, the greatest air loss for any tire was 10 lb. On each day thereafter, the tires were brought back to 28 lb.

Finally, after the car had been driven 1,051 miles, one tire dropped from 28 to 10 lb pressure, and then went completely flat after the car had been standing about 10 minutes. The second gave out at the end of 11 days and the third after 16. It was not until the 18th day, after 1,844 miles of driving, that the fourth suddenly went flat on the road. If any one of these tires had been punctured accidentally, the excessive amount of air required to keep it properly inflated should have been taken as a warning.

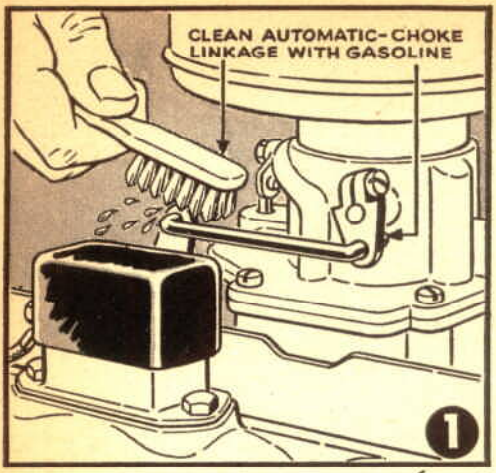
One important point to remember in applying the air-loss system is that tires should be gauged and inflated only while they are cool; that is, at atmospheric temperature. During operation, normal flexing of a tire generates heat, and the heat causes the pressure to increase, possibly several pounds. If a tire is inflated—or deflated—at this time to what is assumed to be correct pressure, it will be underinflated when cool.

To make the air-loss system work to your best advantage, it is therefore advisable to have your own hand gauge and use it before moving the car from the garage. Then, if no tire shows an excessive loss, you can drive to a filling station and bring them up as needed. But if one does show a sudden drop, better investigate at once. END

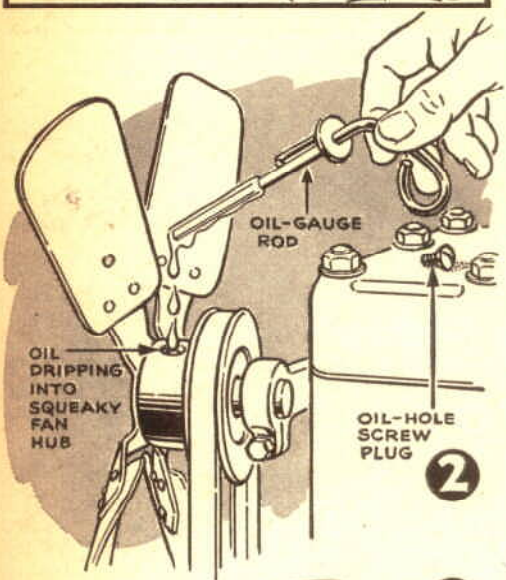


Gauge your tires weekly, taking the reading after the car has stood at least two hours

Hints From the



1. Automatic chokes sometimes get blamed unfairly. Here at the Model Garage we've learned to look first at the linkage between the carburetor and choke-control mechanism. Oil on the connecting lever will gum it up and make the choke sluggish. A toothbrush dipped in gasoline removes oil and dirt; very often that's all that is needed.

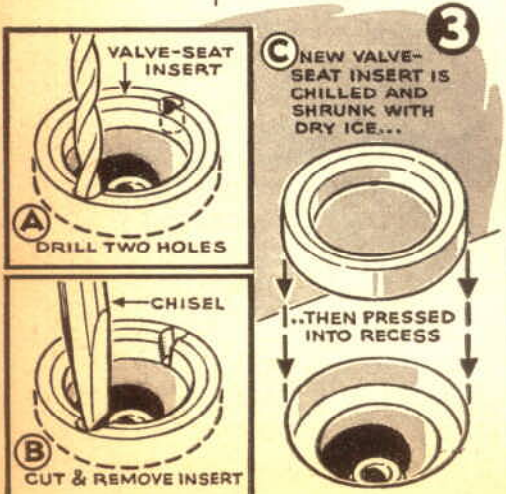


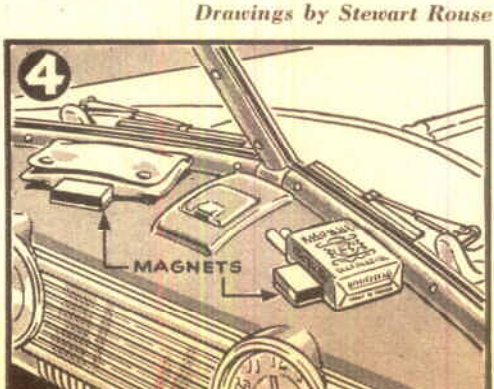
2. Fan Squeak Gives Warning. Many fans start to squeak when lubrication is neglected, and a scored shaft is never far behind. Marion L. Rhodes, of Knightstown, Ind., heard the warning noise, but he was on the road, had no oil can, and was miles from a service station. To forestall trouble, he removed the screw plug and held the oil dip stick over the opening.

3. Freeze a New Insert Ring. If valve inserts are being replaced and don't come out easily, remove with a drill and chisel, taking care not to damage the recess. Pack new rings in dry ice for at least 15 minutes to shrink them.

4. Magnets Peg Things to Dash. Cigarettes, sun glasses, and the like are always in reach for William G. Hykle, Montreal, who uses magnets to hold them up against the windshield frame on his car's sloping dashboard. Felt glued under each magnet keeps it from scratching.

Drawings by Stewart Rouse





Model Garage

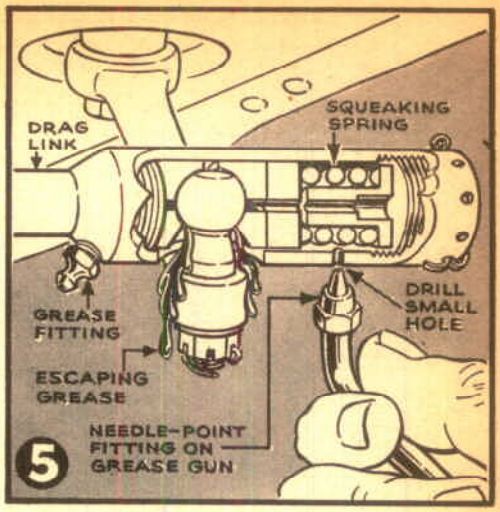
5. Grease Stops Squeak. A persistent squeak when you turn the steering wheel may come from the spring-cushioned end of a drag link that hasn't been lubricated properly because the grease didn't reach the spring. The squeak can be stopped by drilling a tiny hole in the housing and forcing grease directly to the spring.

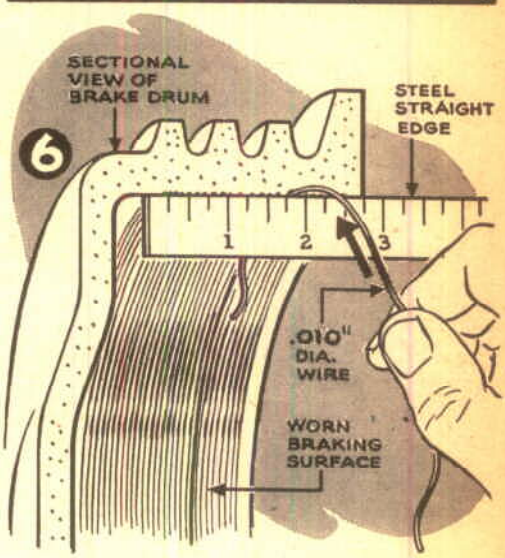
6. Gauging Brake-Drum Wear. John Krill, of North Lima, Ohio, reports that one truck-fleet superintendent uses a straightedge and .010″ wire to determine if brake-drum scoring is bad enough to demand machining. If the wire passes through any groove, the surface is considered in need of refinishing.

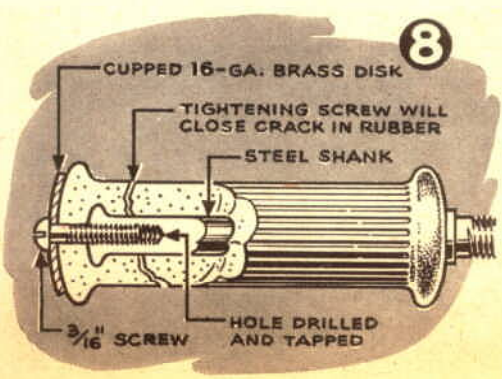
7. Blow Out the Dirt. One thing you'll never see in the Model Garage is a mechanic grab a wrench and remove a plug without preliminaries. Dirt should first be blown from the seat with an air hose—or failing that, a tire pump.

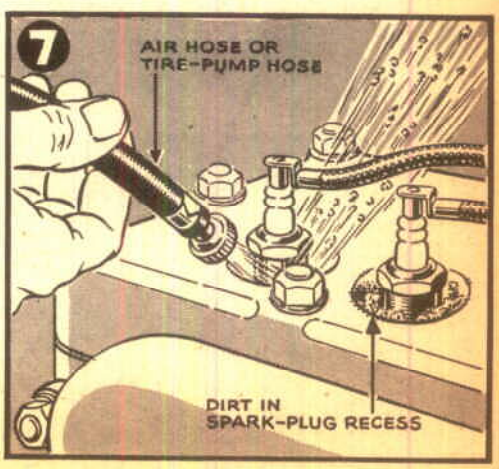
8. Cycle Footrest Repaired. If a crack occurs in the rubber casing of a motorcycle footrest bar, cut a disk out of 16-ga. brass, cup with a ballpeen hammer to conform to the casing, and drill the disk and shank for a 3/16″ screw. Turning up the screw will close the crack. I. J. Stretten, Detroit, makes the suggestion.

Gus Wilson

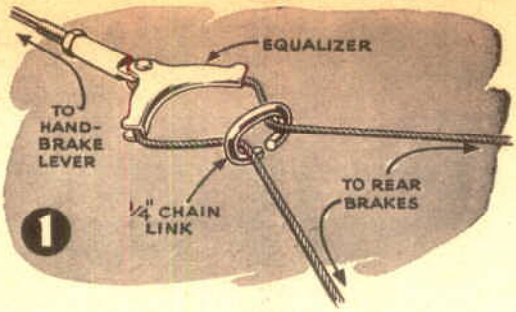


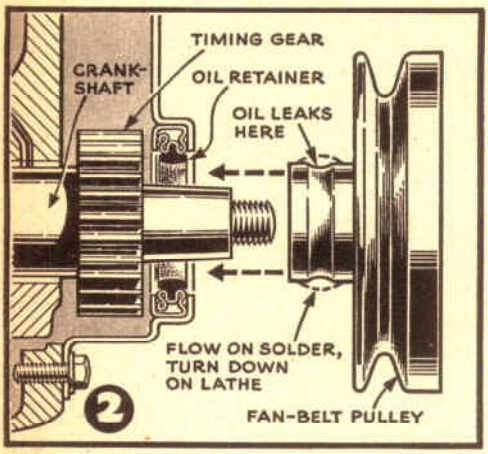






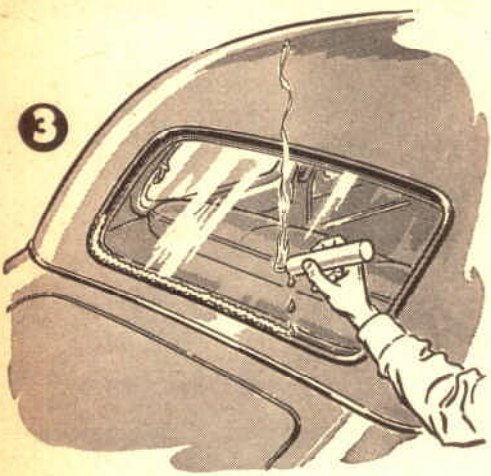
AUTO HINTS





1. HAND-BRAKE CABLE SLACK can be taken up when no more threads remain in the clevis by slipping a ¼" chain link over the cable near the equalizer. By pulling the cable together this provides 1" more of threads for adjustment. Use a replacement tire-chain link, and bend it closed after installation.—H. G. WEBER.

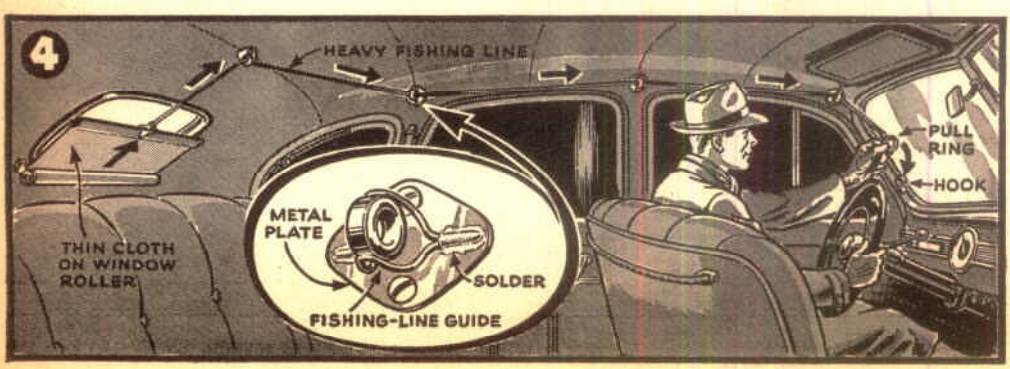
2. SOLDER ON THE WORN HUB of a fan-belt pulley will stop an oil leak when grooving by the oil retainer after long service has destroyed the seal. Build the hub up well with solder; then turn it down in the lathe, leaving it a little high to make up for wear on the retainer itself.—R. L. MCCLANNAN.



3. RAIN-LEAKING REAR WINDOWS and windshields can be plugged with wax dripped from a candle into cracks in the rubber seal. Drip the wax on for several inches on both sides of the breaks. Until the sun melts the wax thoroughly, the leak won't stop completely.—C. D. BASSETT.

Drawings by STEWART ROUSE

4. REMOTE REAR-CURTAIN CONTROL enables a driver to shut off glaring headlights from a car behind and to reopen the shade and restore rear-view vision when the car has passed. The pull cord is a heavy fishing line threaded through a series of casting-rod line guides on metal plates.



MONOXIDE Thumbs a Ride

Drowsy while driving? Make sure carbon monoxide isn't poisoning you at the wheel. A checkup may save a life.

CARBON monoxide is a hitchhiker. We all know that this odorless gas, generated by an automobile at the rate of about a cubic foot a minute, will quickly turn a closed garage into a death chamber, but we are apt to overlook the fact that it rides along each time we drive out on the highway.

Its handiwork shows up in traffic accident news more frequently than most persons realize. The police reports may say that the driver "apparently fell asleep," or perhaps a big question mark appears in the space where the cause of the accident should be recorded, since no one remains alive to tell about it. Some of these accidents, it is true, result from lack of sleep or just plain weariness after long hours of driving, but there seems to be no doubt that a good percentage occur when carbon monoxide, stealing a ride in the car, dulls the senses of the driver.

As an agent of death, carbon monoxide works by combining with the red corpuscles, preventing the blood from carrying oxygen throughout your body. A little goes a long way. Just two parts in 10,000 of air are enough to impair perceptions; and not much higher concentrations, breathed for a sufficient time, can prove fatal. When a car engine is operated in a closed garage, the air becomes dangerous to breathe within three minutes. Safety education has made most people aware of this, but comparatively few realize that there are equally important precautions that should be taken to minimize the danger of carbon monoxide out on the highway.

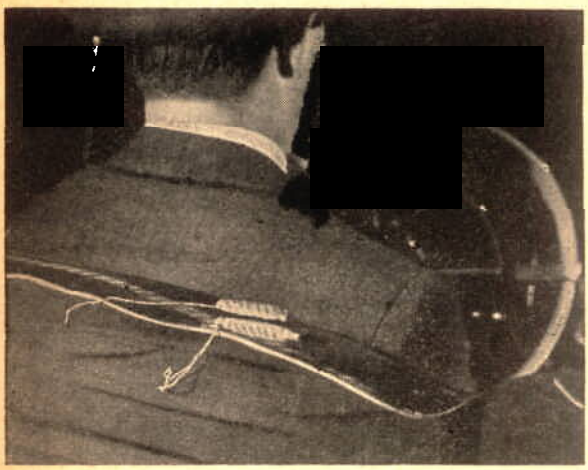
Tests conducted in Connecticut by the State Health Department and the Travelers Insurance Company underline the need for such precautions. Traces of carbon monoxide were found in nearly 50 per cent of a

group of cars checked at random along the highway, and in more than 10 percent there were dangerous concentrations—enough to dull the senses, and possibly produce unconsciousness.

Concentrations of carbon monoxide below about 3.5 parts in 10,000 are not immediately dangerous, but if you are exposed long enough this amount will produce headache, mental dullness, and a sense of physical weariness. At 2 parts in 10,000, these primary symptoms generally occur in about two hours. Such symptoms, usually disregarded, are often the cause of inefficient driving and accidents.

Hence, if you ever develop a feeling of unreality while driving and the traffic and city street or countryside seem like something seen in a dream, it is high time that you open the car windows wide and pull up and park immediately until you again feel normal. Also, be wary of a headache that develops while you are driving.

If you suspect that an unsafe percentage of carbon monoxide is contaminating the interior of your car, you can make a test with the detector ampoules manufactured by the Mine Safety Appliances Company, of Pittsburgh. Although devised for the detection of dangerous carbon monoxide concentrations in manhole entrances, the ampoules are now used by garages, chemical plants, and other industries for the same purpose. They cost $1.25 for 10 ampoules.



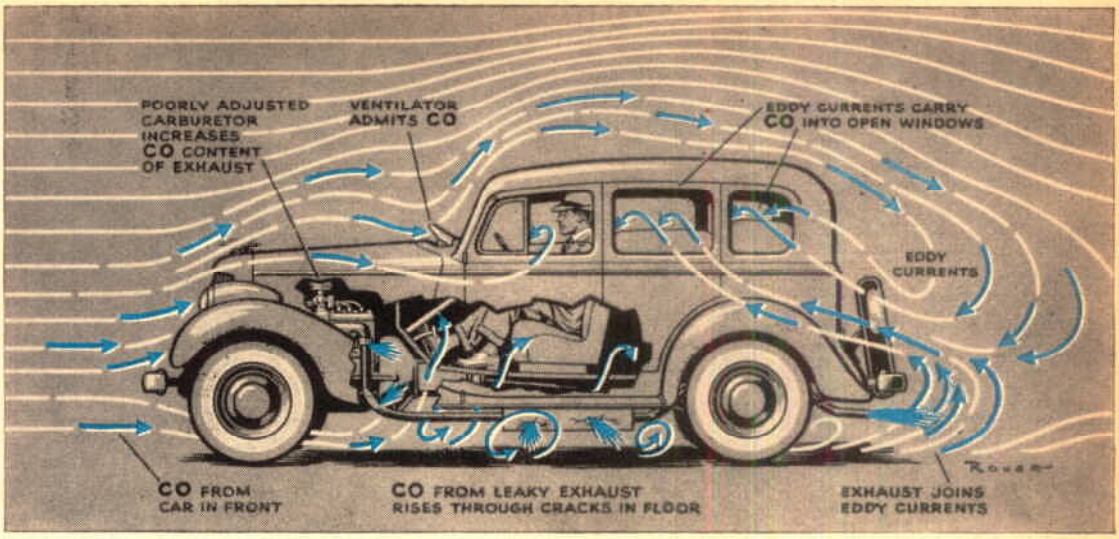
Small chemical detectors made by the Mine Safety Appliances Company provide a way of testing a car for carbon monoxide.

If monoxide is present, the detector will change color, the final color depending on the gas concentration. Comparing the exposed detector with a chart shows the concentration.

Smaller than a cigarette, one of these ampoules will detect the presence of monoxide in air in concentrations as low as 2 or 3 parts in 10,000. They consist essentially of palladium chloride in an acetone-water (nonfreezing) solution, sealed in a glass tube surrounded by cotton.

In use, the ampoule is crushed between the fingers, allowing the solution to saturate the cotton. The ampoule is then left for 10 minutes in a place where carbon monoxide is suspected. Originally, the crushed ampoule is yellow. If monoxide is present, metallic palladium will darken the cotton, the depth of discoloration (running from a light gray to a grayish black) depending on the concentration of the gas. The concentration then can be determined by comparing the color of the ampoule after 10 minutes with the scale of colors on a chart furnished with the set. In a car you might place the crushed ampoule on top of the front seat, or better still, hang it by a cord from the roof.

Contamination of the interior of a moving car may result either from the exhaust gases of your own car or those close ahead. A leaking exhaust system or a rusty or battered muffler often will allow the deadly gas to seep through cracks in the floor or doors. In some cars exhaust gases, instead of flowing away to the rear, actually move along with it because



Monoxide, from the car in front as well as from your own, can enter by many routes, including open windows.

of the turbulent flow of air immediately behind, and monoxide-laden eddy currents may whip into the open windows—looking for a victim. If all of these sources of contamination joined forces, as easily they might, the car could soon become a rolling death trap.

Since carbon monoxide is a product of poor combustion, proper adjustment of the engine is an important factor in reducing the hazard. Experiments by the U. S. Bureau of Mines have shown that the proportion of this gas in automobile exhausts ranges from 1 to 13.72 percent and that the amounts vary widely at high and low speeds and with good and poor carburetion. As combustion efficiency increases, the monoxide content of the exhaust naturally decreases. The percentage may be as high as 13 from a poorly adjusted motor running at 50 percent efficiency. When the car has been tuned up to run at 80 percent efficiency, the monoxide content drops to 4 percent.

These percentages sometimes are put to use in reverse. Some garages have equipment to determine the monoxide content of a car exhaust. From this, it is possible to estimate the efficiency of the engine.

Flow Meter Developed by Ford Tests Crankcase Ventilation

DESIGNED for use in a test car under actual operating conditions, the flow meter shown in this photo was developed by the Ford Motor Company as a means of measuring the efficiency of various systems of crankcase ventilation. Such ventilation, which involves an induced flow of fresh air through the crankcase to carry away blow-by gases escaping past the piston rings, has been the subject of considerable research and study.

Instantaneous readings may be taken from the Ford meter, which is two duplicate instruments built as one and attached to the normal engine ventilating system. One measures the flow of fresh air entering the engine, the other the outlet flow.