



Charging current for a motorcycle battery must not exceed 2 amp. Never connect it directly on an auto-battery charging line. The inset is a cut-away of a Harley-Davidson battery.



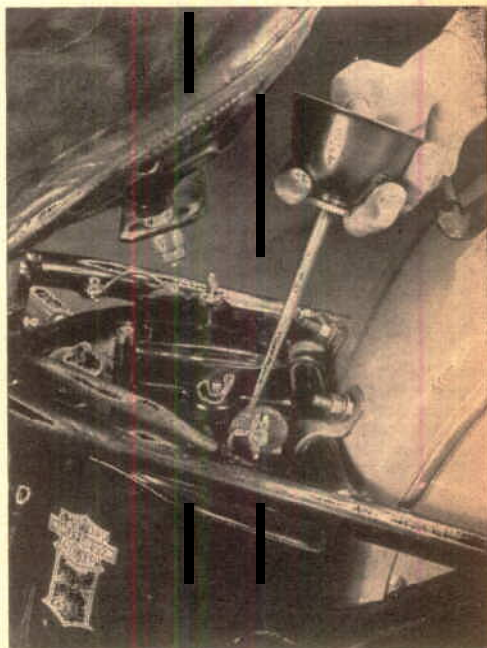
Check the specific gravity each week. At the same time add distilled water if needed. To insure uniform coverage of the plates, make certain the motorcycle is perfectly upright.

More Juice for Your Motorcycle

YOU can't expect to abuse a motorcycle battery and get away with it. In general, you should treat it like an automobile battery. But in some respects it's a special case, requiring extra care.

Make a habit of checking the specific gravity of each cell once a week. If the hydrometer reads 1.150 or less, recharge the battery promptly. With the hydrometer, also add distilled water as necessary to raise the level about 5/16" above the plates. It's best to do this just before using the machine. Avoid too much water.

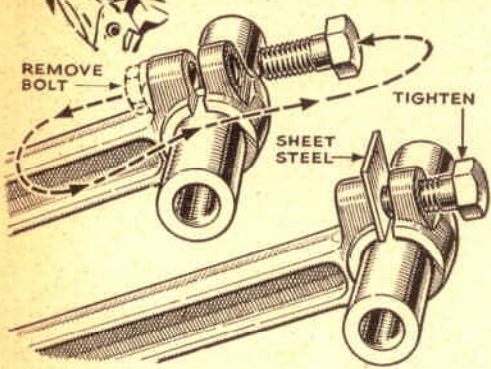
Don't hook up a motorcycle battery directly on an auto-battery charging line. The current is excessive. Two amperes is tops for a motorcycle battery. If automobile charging equipment is used, bleed off a lower charging current. This can be done by connecting the battery in parallel with one of the car batteries on charge. Be careful not to charge beyond 1.275 specific gravity.



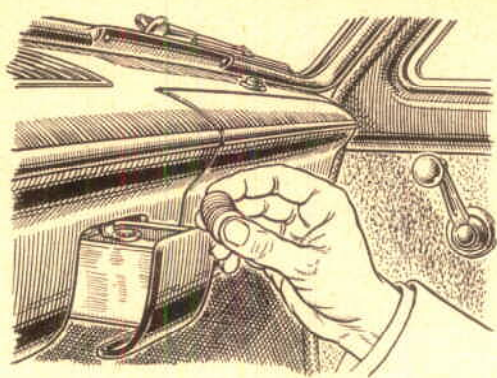
Apply a drop or two of oil occasionally to the felt washers on the terminals. This forms a protective film on the terminals, preventing corrosion and permitting better lug contact.



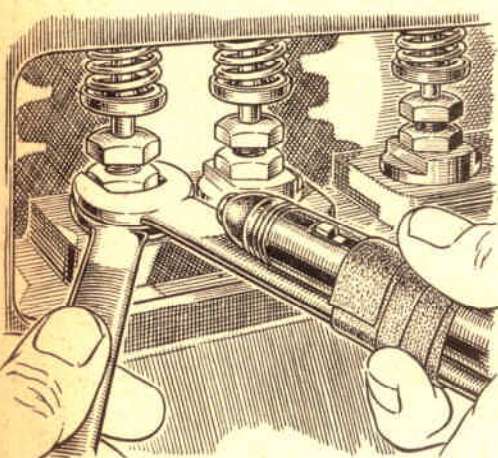
Hints from the Model Garage



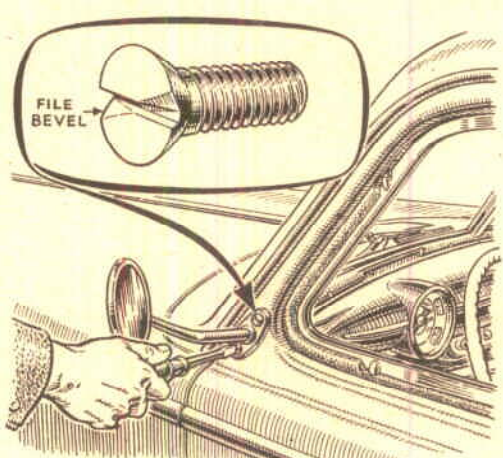
Con Rod Pressed Open. Wrist pins of the kind shown will not always go in easily, even with the bolt loosened. If assembly proves difficult, reverse the bolt as shown and use it and a piece of thin steel to spring open the con rod very slightly. Replace the bolt in its proper position after doing this.



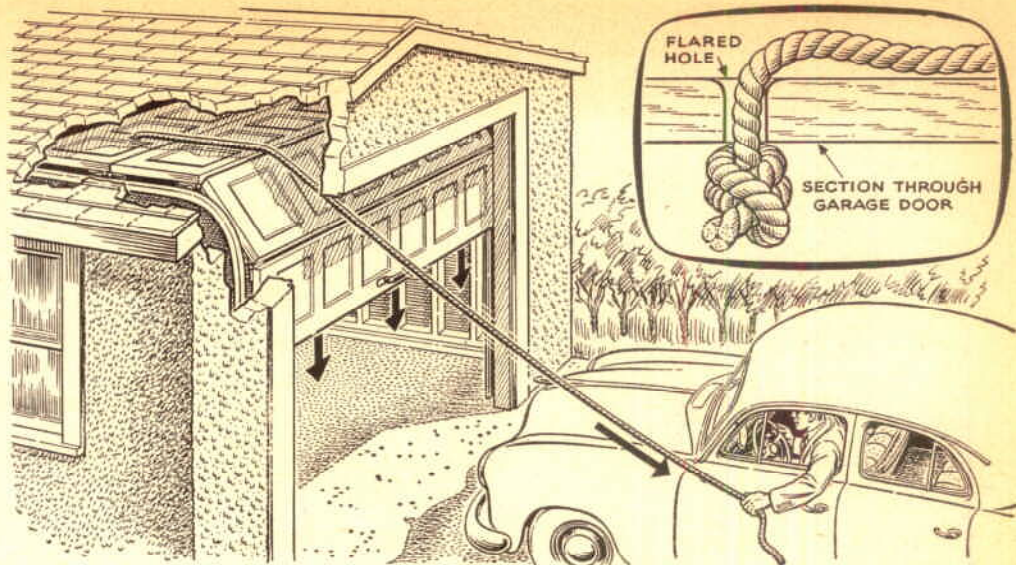
Coins Kept in Ash Tray. If you are a nonsmoker, the dashboard ash tray is a handy place to keep a supply of pennies, nickels, and dimes for parking meters and toll gates. For convenience in removing the coins, bend down the snuffer. Felt or cotton lining cemented to the bottom and sides will stop rattles.



Light on the Spot. Adjusting valve tappets on a car is a fussy job to do just right. What makes it troublesome is the necessity of manipulating wrenches and a thickness gauge in cramped quarters with inadequate light. Albert S. Eaton, of Belmont, Mass., reports that the work goes a little easier if you tape a pocket flashlight to the upper tappet wrench.



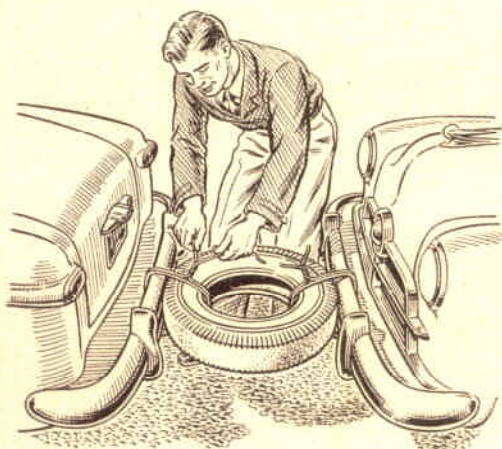
Filed Screws Prevent Theft. If you attach a mirror, road light, or other accessory with external screws, safeguard it against theft by filing off those corners of the slots that the screwdriver bears against during removal. Once tightened, the screw is next to impossible to remove, so use it only on permanent installations. You can retighten it, however, if vibration loosens it.



Rope Closes Overhead Door.

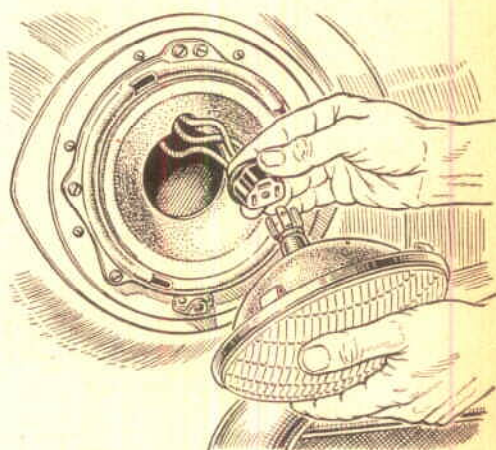
With this arrangement, you don't have to get out of the car to close the door after leaving the garage. Just grab the rope dangling near the jamb, and give it a pull after you have backed out. Attach the rope (a

clothesline will probably serve) by drilling a hole a few inches down from the top of the door. Charles Morse, Elmira, N. Y., says he finds the rope trick very convenient. For easy operation of the door, keep the rollers and track well lubricated.



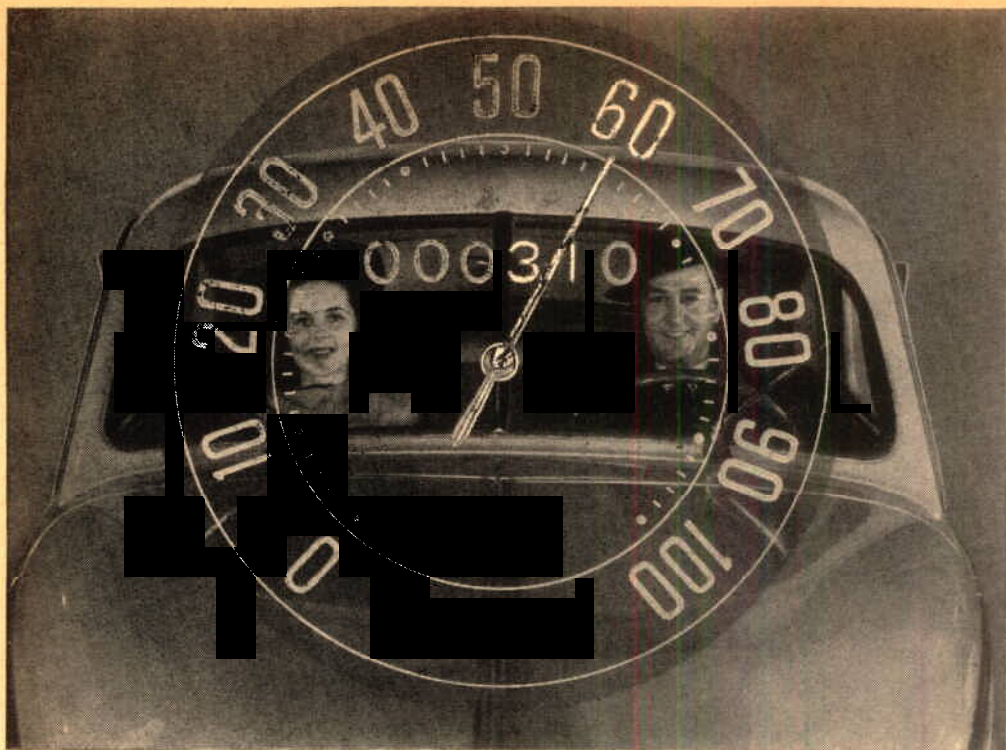
Tire Cushions Towing Bumps.

An old tire makes an excellent coupling to a car that you want to tow. Pass a few turns of heavy wire or rope around the tire and the respective bumpers of the two cars and you are ready to go. The tire effectively smooths out the jerks and nicely cushions the bumps in stopping, writes Leslie H. Housel, of Grass Lake, Mich.



Corrosion Knocks Out Lights.

If either beam of a sealed-reflector headlight goes out, be sure you really need a new unit before putting down the cash. In some cases, particularly in older cars, you will find the contacts have become so corroded that the resistance prevents the lamp from lighting. Careful cleaning of the contacts will restore the light to usefulness.



Driving at 60 with only a few miles "on the clock" isn't as harmful for a brand-new car as it once was.

Must You Break In a New Car?

Fast speeds at lower mileages are now all right, but the answer still is "yes" if you want the best ultimate results.

By R. P. Stevenson

BREAKING in a car no longer demands the crawling speeds of a decade ago. Improvements in design and manufacture, and in lubricants, have contributed to outmoding the old, slow break-in process. Since the war, virtually all manufacturers have issued revised recommendations for operation of their cars during the first few thousand miles, most of them now approving faster speeds at lower mileages. Going even farther, several have dropped the subject of break-in entirely from the instruction booklet they furnish with a new car.

Consequently, you may hear it said that a break-in period no longer is necessary. If you do, it would be well to raise a skeptical eyebrow—particularly if you are interested in getting the most from the investment a new car represents.

The fact is that, although you may safely drive fast sooner, you still are dealing with a piece of machinery that is not yet capable of its ultimate performance at the time it reaches you, however perfect it may seem in comparison with the standards of some years ago.

A new car these days has many so-called frictionless bearings (that is, ball and roller), but it also has many friction-producing metal-to-metal movements—rotating contacts, as in the crankshaft and wristpin bearings; and sliding contacts, as in the cylinders and rings. On how these surfaces wear in, a great deal depends—including the eventual

power of the engine, its silence or noisiness, and its oil economy.

As any machinist knows, a properly sized bearing at first is a bare running fit, with a tendency to be stiff, to run hot, and to seize or score if not babied. As it runs, the exceedingly small (millionths of an inch) protuberances on the facing surfaces are worn away, leaving a bearing that is free running but in no way loose.

Improvements in the finish of mating parts are given a big share of the credit for cutting down run-in time. By modern techniques, they are sized within a few ten-thousandths of an inch and given a smoothness of millionths of an inch. As a result, they are ready for their best work sooner.

In the field of metal finishing, a process that is a comparative newcomer has been as-

suming a position of increasing importance. This is honing, a method by which a bonded abrasive is worked over an area. If the customary finishing methods were to be ranked in an ascending order of nicety, honing should be given a place above the other three—machining, which at best gives a comparatively rough surface; grinding, always useful but by no means perfect; and lapping, which has production disadvantages.

Honing finds perhaps its greatest usefulness in the finishing of cylinder bores, but it also now helps give an ultrafinish to many other auto parts. A great increase in mileage between ring jobs in the last two decades may be traced mainly to this process. Without enlarging the diameter of the bore to any extent, honing knocks down the peaks

Watch These Points During the Break-In



LUBRICATION. Metal-to-metal contacts need plenty of oil while wearing in. So check the oil often.



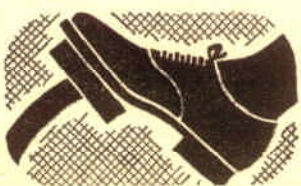
ENGINE HEAT. Allowing a new engine to overheat is an invitation to all kinds of expensive repairs.



WATCH SPEED. Gradually push the car up to higher road speeds. Crawling along won't break it in.



WARM UP FIRST. Allow the engine to run a bit before driving so the oil will be warm and flowing.



BABY THE BRAKES. Go easy on the brakes for a few hundred miles until the linings are broken in.



SERVICE CHECKUP. Most new-car service policies entitle you to these. Don't fail to have them.

and jagged tips of surface irregularities that are apt to wear out the rings.

Until a bearing has run in, it will operate at a higher temperature than ordinarily. For that reason proper lubrication is never more important than during the break-in period, if scoring or seizing are to be prevented. Motor oil has a dual function—to cool the moving parts and to reduce friction. New processes by which protective metal platings are applied to bearing surfaces in some new cars offer a safeguard against temporary oil starvation.

Always Warm Up the Engine

Temperature is an all-important tipoff while an engine is new. Like the temperature of your own body, the engine temperature quickly reflects any abnormal condition. Never allow a tight engine to run too hot. If you do, your nose probably will let you know, since an engine running on the hot side has a distinctive smell—a hot metal and varnish odor. So keep an eye on the heat indicator—after the engine has had time to warm up.

Proper warmup is essential whether an engine is old or new. Engineers have found that the greatest amount of damage occurs during the first three or four miles of driving, when the lubricants have not yet thinned out sufficiently to coat all the moving parts. Before leaving the garage, let the engine idle for about five minutes. If you must set out immediately, drive slowly for the first dozen miles or so.

During the break-in period, some new cars may require what appears to be an unusual amount of oil. This should cause no worry. Until the piston rings are properly seated, oil may get past the rings and into the combustion chamber. This often is helpful, for the extra lubrication allows the rings and pistons to wear more gradually and form a good seal. After the car has been driven 2,000 or 3,000 miles, the oil consumption should drop to normal.

Faster Speeds Make Better Cars

A memorandum distributed by Plymouth to its dealers explains that some new owners who report using more oil than expected may be keeping the oil level at the "full" mark rather than the "running level" mark on the dip stick. When the level is too high, the excess is vaporized and escapes through the crankcase ventilator. Plymouth advises that in checking the oil when the engine is

warm the level should be kept up to but not above the "running level" mark.

When many new cars are delivered, the crankcase oil is S.A.E. 10-W, no matter what the season. This should remain in until the first checkup—at 1,000 miles, or whatever your service policy stipulates. If oil must be added before then, the manufacturer usually recommends use of the same grade. A careful owner will of course not neglect to take in his car for these checkups.

There is now a fairly general feeling among automotive engineers that faster break-in speeds produce a better final result. The slow speeds of the past sometimes failed to accomplish the purpose for which they were intended. Although the driver may have complied with all instructions, his car would sometimes not be broken in by the time the specified mileage figure had been reached. Consequently, when the driver speeded up, thinking it was safe to do so, the bearings often were scored or other damage caused.

One prominent Detroit engineer believes that limited break-in speeds are not needed by a man with good engine sense—an expert who knows and understands his car and can make it a part of himself. Such a driver can feel when a new car is tightening up and not responding as it should. When that occurs, he will ease off to a slower rate. Unfortunately, not all drivers can classify as expert.

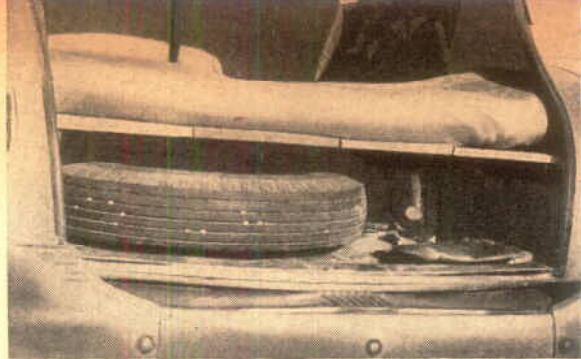
Break In the Brakes Too

One rule on which there is agreement is that a new car should never be held at any speed the first time it is pushed to that figure. For example, the first time you reach 50 m.p.h., keep the car there only a brief time before dropping back. Then, after it has been raised to 50 on several occasions, push it to another slightly higher point. Keep repeating this procedure until you have reached the peak performance of the car. If a car never has been driven over 40, don't raise it suddenly to 70 or 80. Work it up gradually.

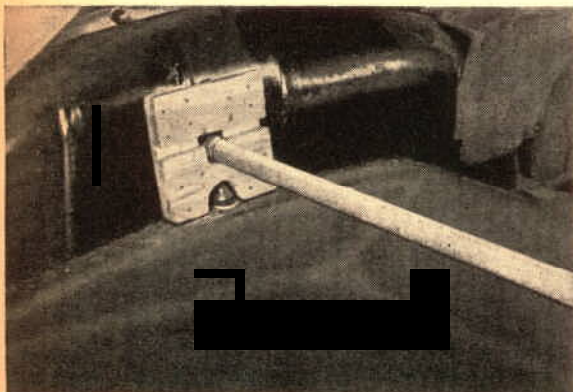
In addition to the engine components, the rear axle, gears, and brakes also require time and use to wear in properly. Rear ends used to be especially subject to damage, but the high-pressure hypoid lubricants now used in many cars help reduce this. In the case of the brakes, fast stops should be avoided for the first few hundred miles until the linings acquire a smooth finish. **END**



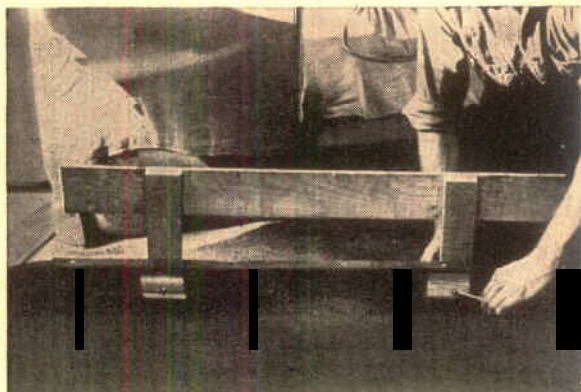
Full-length sleeping comfort on vacation trips is provided by this modification of a two-door sedan. The foot of the bed is in the trunk.



Here's how the bed looks from the trunk end. This one takes a 6' double mattress. There's room for the spare tire and tools under it on the floor.



The other end of the pipe is held between blocks. If the spare-tire brace isn't on the side, put in blocks at both ends and use a wood crosspiece.



For the front support, a T-shaped piece is bolted to the front of the rear-seat frame. A sort of low sawhorse will do if bolting is inconvenient.

Build a Bed in Your Car

CONVERTING your car so that it will serve as a bed on vacation trips isn't a difficult job, and it will free you of dependence on tourist courts and hotels. Most coaches and sedans as well as many coupes can be modified simply by removing the back seat and adding a mattress platform. Though less flexible than arrangements in which seat backs fold down to form a mattress, the conversion is far simpler and entirely satisfactory.

After removing the rear seat and cushion, take out the cardboard or fiber trunk partition by removing the screws or prying off the locking buttons. If there is a light channel-iron brace between the seat and trunk, saw it out and drill holes so it can be replaced later with strap-iron "splints" and

bolts. In cutting, leave stubs long enough to take the replacement bolts.

Many cars have the spare-tire bracket on one side of the trunk. In this case, a length of 1" pipe can be fitted over the bolt in the tire brace and run to a notched wooden block fastened at the opposite side. It serves as a support for the foot of the bed platform. If there is no tire bracket on the side, use wooden stands at both ends of the support, which then may be a length of 1" by 3" stock turned on edge. In any event, level the support by having the blocks or the block and bolt at the same height.

Build a support for the head of two up-rights and a 1" by 3" crosspiece bolted to the seat-cushion frame or, if this is impracticable, on small sawhorse legs placed close

AUTO HINTS

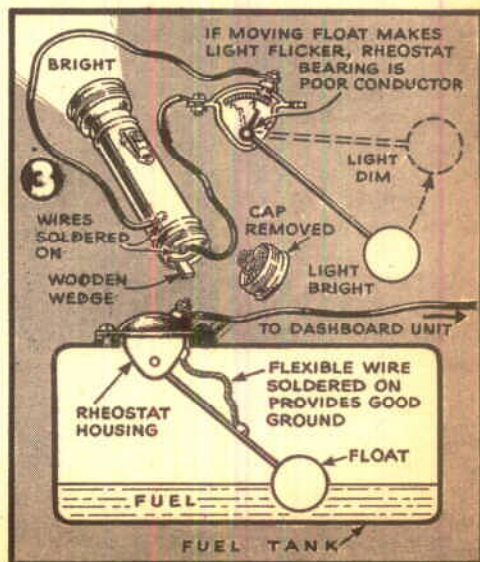
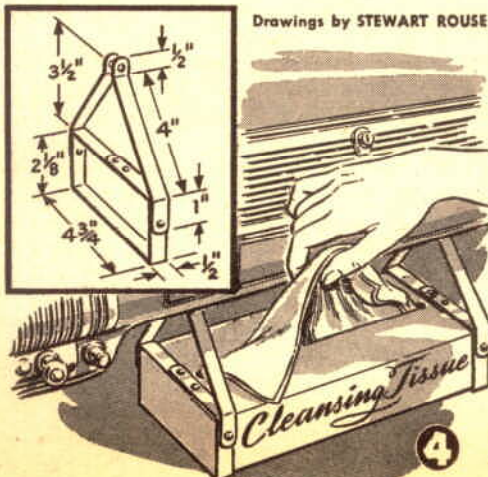
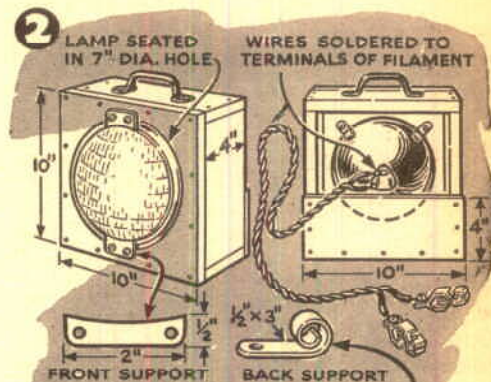
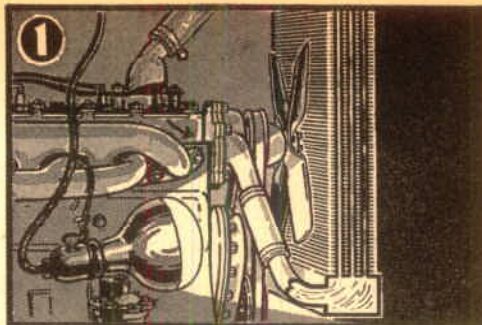


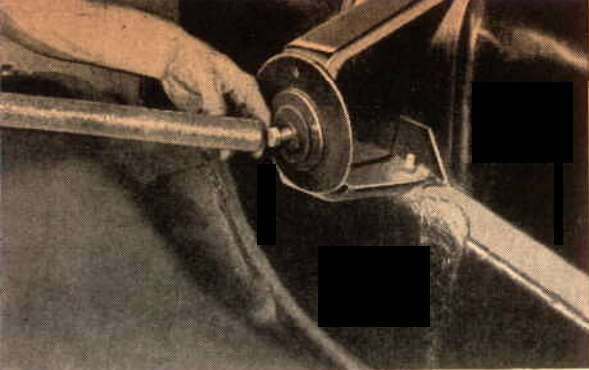
1. COLD-WEATHER STARTING in an unheated garage is often made easier by heating the engine independently. One way is to mount an infrared heat lamp under the hood and direct it on the bottom of the radiator. It will warm the engine in a short while. In very severe weather, it can be left on all night.—HARRY MORRIS.

2. A TROUBLE LIGHT can be made of a discarded sealed-beam lamp if a test shows one filament still to be good. Mount the lamp in a box and solder on two long wires ending in clips.—A. G. BELESON.

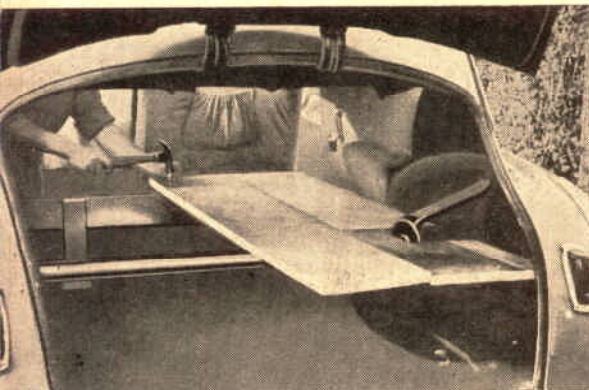
3. ELECTRIC FUEL GAUGES, which sometimes give trouble when the tank float arm makes an imperfect ground, can be repaired by soldering a jumper on the arm and rheostat housing. To test the old ground, remove the unit and connect it in series with a flashlight.—VAN ALLEN LYMAN.

4. CLEANSING TISSUES for use on a windshield, lenses, or soiled hands are conveniently held in banding-iron brackets under the dashboard. An empty box can be removed and a new one put in by spreading the bracket arms.—S. P. MEEK.





After removal of the back seat, supports for the bed platform are put in. One can be a length of 1" pipe over a nut in the spare-tire side brace.



Finally planks are nailed to the front support as a platform for the mattress. When the vacation is over, the bed is taken out and the seat put back.

By H. C. Marhoff

to the back of the front seat. Be sure it is level with the foot support. Nail planks for the platform to the front support; their length will be governed by available car space and the length of the mattress. Notch the outer plank on the tire-bracket side to pass this bracket, which will serve as an anchor. If there is no side tire bracket, anchor the two outer boards with metal straps held by body bolts.

Almost all coaches have room for at least a 6' mattress. Extra blankets folded under the mattress will make up in part for lack of a bedspring, though an air mattress is preferable. The spare tire and tools can go under the bed platform. Luggage can be carried on the bed when traveling and stacked at night on the front seat.

Knowing Auto Noises Can Speed Repairs

EVERY auto mechanic has a lingo all his own to describe trouble noises. One man's "bump" is another's "clunk." A "hiss" may turn up as a "buzz," "wheeze," or "fry."

Hearing the noise, the experienced mechanic usually knows where to locate the trouble. But if you just drive in and ask him to "get rid of the squeal," he may go off on the wrong track.

To avoid misunderstandings between driver and mechanic, General Motors engineers have divided trouble noises into seven classifications. These are:

The Rattle. A series of hard, sharp sounds in rapid succession, like a hard object being shaken around in a metal container. This noise usually indicates a loose or broken part striking against another.

The Thump. A dull sound, generally made when a soft part strikes against a hard part. An example is the noise made by a deflated tire on the road.

The Squeak. A sharp, shrill, piercing noise, generally made by two dry metal parts rubbing together. The sound may be sharp and erratic, or drawn out—a squeal. Lack of lubrication causes many squeaks.

The Grind. This is a continuous crushing sound like a part being crushed between two revolving parts. Such a sound might come from the transmission.

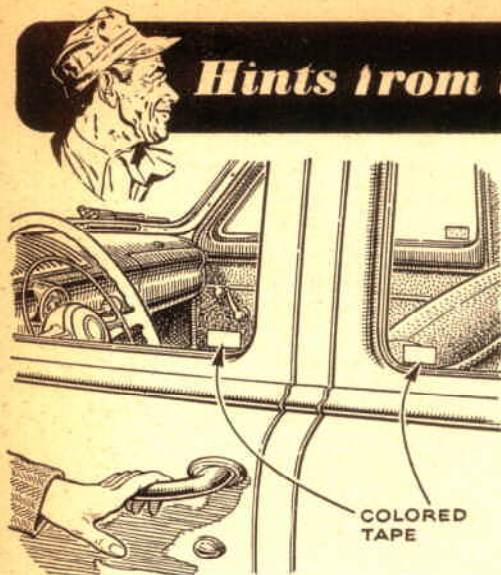
The Knock. This is a sharper and more distinct sound than a thump. It's generally associated with a loose rod or crankshaft bearing. (Not to be confused with the "knock" or ping of a laboring engine.)

The Scrape. A grating or harsh rubbing sound, often made by two pieces of material rubbing together. The sound of a dragging brake could be described as a scrape.

The Hiss. This is like escaping air or steam or the sound of water on a hot metal part.

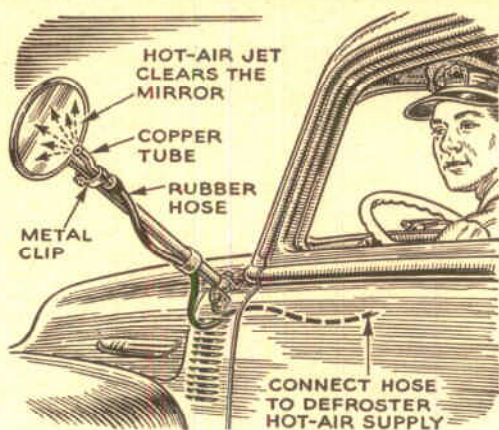
These definitions are contained in a booklet, "How to Report Trouble," prepared by GMC Truck & Coach Division for distribution to coach drivers. Besides telling *what* the noise is, the driver is expected to report *where* it comes from and *when* it happened. With this report, the mechanic has a good start toward learning *why* it happened.

Hints from the Model Garage



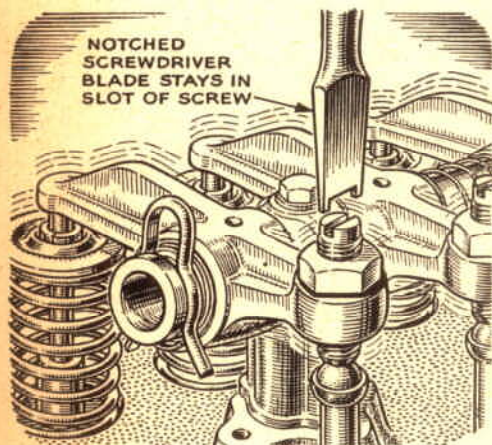
Tape Shows Windows Are Up.

If you keep your car windows clean, it may be difficult to tell that they are up when you're locking the car. Small spots of colored tape applied to the inside near the bottom will show you at a glance.



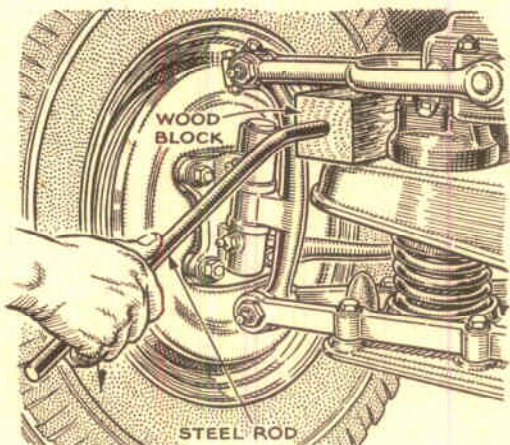
Defroster Clears Mirror.

In sleety weather, Ronald Weller, of Jerseyville, Ill., found that the rear-view mirror on his truck frequently became coated with ice. To keep the mirror clear, he ran a rubber hose from the defroster out to the mirror.



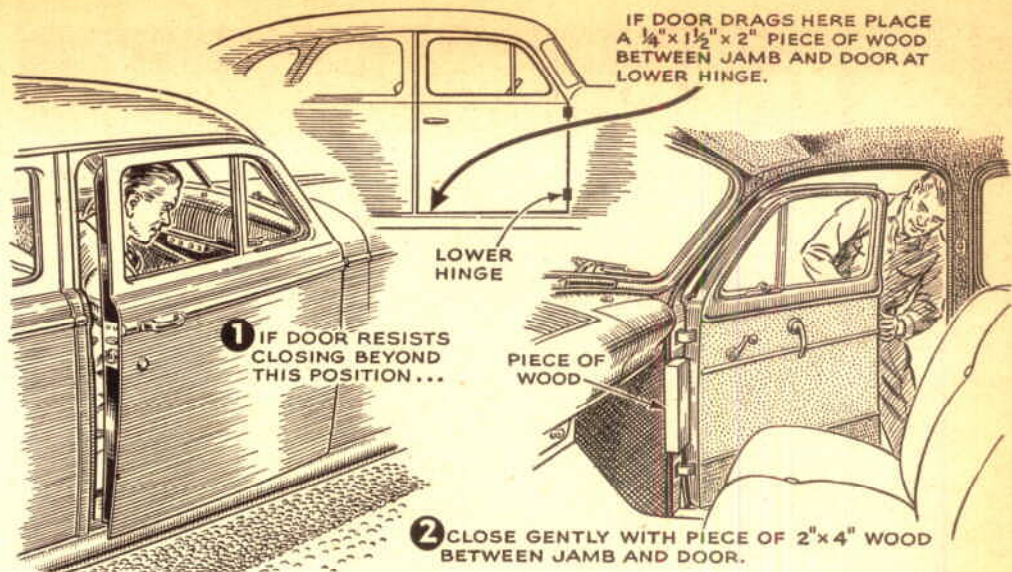
Tappet Adjustment Is Easier.

It is usually recommended that the tappets of an overhead-valve engine be adjusted while the engine is warm and idling. However, you've probably found that it's hard to keep the screwdriver in position on the bouncing adjusting screw. To simplify the task, W. M. Dierks, of Chicago, filed a wide notch in a screwdriver blade. This keeps the blade in the slot while adjustments are made.



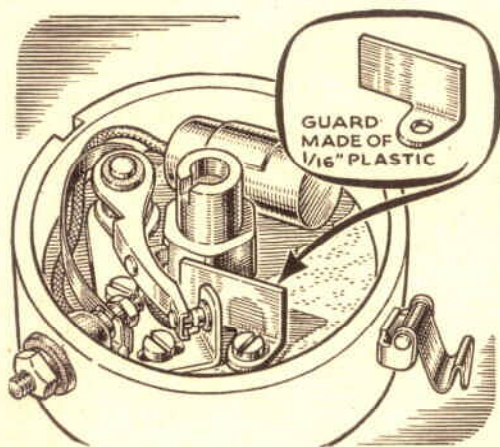
Block Stops Wheel Sag.

If you've ever used a bumper jack, you've probably noticed that the front of a car must be raised quite high before the tire is free. This is because the suspension arms allow the wheel to sag. You can overcome this by thrusting a block of wood between the frame and upper wishbone. A block cut from 3" by 3" stock will do the job. To position the block, fit a steel-rod handle into it.

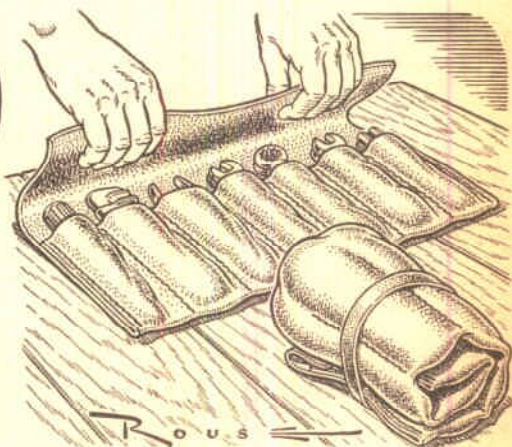


Repairing Sprung Doors. Unless they are too badly damaged, doors with sprung hinges can sometimes be put back into working condition by deliberately jamming them against a piece of wood. Burk Jagers, Rushville, Ind., writes that he has

used the method above. In closing the door, always proceed gently and keep testing—you may have the problem of correcting an overcorrection. Should the door rub at the upper rear corner, place your block of wood between jamb and door at the top hinge.



Guard Prolongs Point Life. Ira S. Nelson, of Chicago, reports that he has experienced considerable difficulty with burned and pitted breaker points on his '49 Ford V-8 because oil worked up the distributor shaft. As a solution, he installed a small plastic shield between the cam and breaker arm, mounting it with a 6-32 screw as seen above. The shield helps keep oil from being thrown on the points.



Rubber Kit Stops Rattles. This tool kit, made from an old inner tube by Robert R. Leist, of New Albany, Ind., keeps small tools from rattling around while carried in the car. Cut a piece from the tube large enough to suit the tools you want to have at hand. Pockets to suit them can be sewn with strong cord. Cut a rubber band from the same tube to put around the kit after it has been rolled up.

Give Your BATTERY a Break

ALL WORK AND NO CHARGE WILL MAKE IT GO DEAD. HERE ARE TIPS TO PROLONG ITS LIFE.

By RICHARD W. CRANE

MOTORISTS sometimes literally work a battery to death. Perhaps they are careful to keep the electrolyte above the plates, but all too often responsibility stops there. They overlook the fact that unless the car is operated so as to keep the rate and periods of battery discharge at a minimum, the battery will have little chance of lasting long.

In this respect, judicious use of the starter is the most important point, for a battery expends more energy in cranking a car than in performing any of the many other jobs it is called upon to do. Here are five ways you can reduce this starter drain:

1. When possible, park on a hill and start the engine by coasting.

2. Depress the clutch while using the starter. This disconnects the transmission and lessens the load. On a sub-zero day, when the oil may be virtually a solid, this may determine whether you ride or walk. Even in warm weather, it will help.

3. To decrease the total load on the battery, shut off all other electrical equipment before pressing the starter button. A relay that is available commercially does this automatically, but you can do it by hand with little trouble.

4. In cold weather, use the light oil specified for your car. But if you are caught in a sudden cold snap with summer oil in the crankcase, it will help to pull out the choke just before stopping the engine. This

should not become a habit, however, for it washes the oil from the pistons and cylinder walls.

5. Develop a technique for starting the motor when cold. If your car does not have an automatic choke, a little experimenting to determine the best choke and throttle settings will save a lot of battery wear. Generally, the choke should be pulled out all the way and the throttle slightly. When the engine takes hold, push the choke in as soon as you can without stalling the engine.

Some drivers habitually pump the accelerator while using the starter. This is unwise. For one thing, an open throttle increases the proportion of air to fuel, making the mixture leaner; and on cars having acceleration pumps, it may also cause flooding. However, on cars having such pumps it may help to push the accelerator several times to the floor *before* touching the starter, since this is a form of priming.

Next to the starter, the headlights are the largest user of battery power. While you may use them freely any time the generator is turning fast enough to compensate for the current drawn, they should be kept off as much as possible when the motor is idling or not running. When the battery is run down and you must drive at night, switch to the parking lights whenever the engine is idling, as while waiting for traffic lights.

On some cars the current the headlights draw does not go through the ammeter. Because of this, it often may appear that

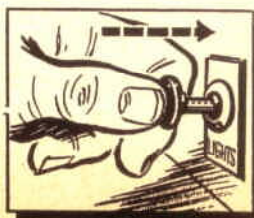
YOU CAN HELP YOUR BATTERY DO ITS BEST JOB. OPERATE YOUR

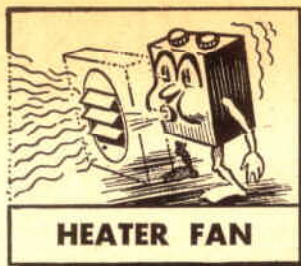
Use the right oil. If the oil is heavy, the starter takes more battery power.

When starting an engine, first turn off the lights and all accessories . . .

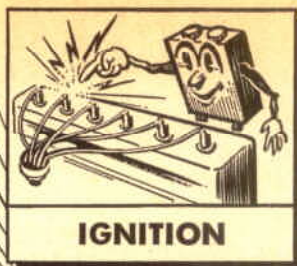
. . . Then adjust the choke (if it isn't automatic), and the hand throttle . . .

Next, pump the accelerator several times to prime the engine . . .





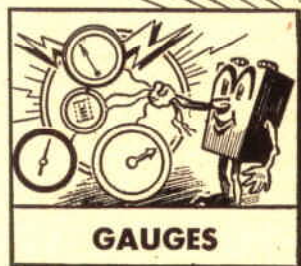
HEATER FAN



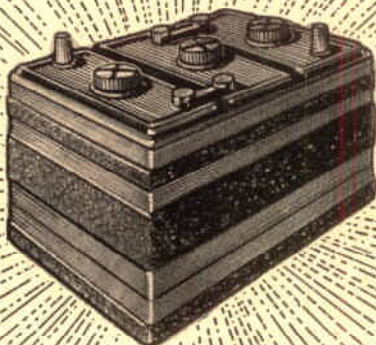
IGNITION



HORN



GAUGES



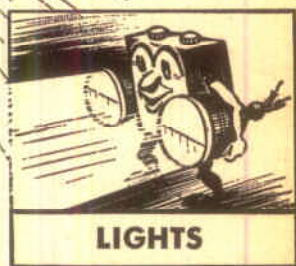
RADIO



STARTER



CIGAR LIGHTER



LIGHTS

A BATTERY SERVES YOU IN MANY WAYS. BUT DON'T OVERLOAD IT.

the battery is being charged when it actually is discharging. Check your owner's manual on this point.

As for radios, heaters, fog lights, and other electrical accessories, it is a good practice to use them sparingly. Each alone

may use little power, but lumped together they take a lot; and when, at night, this is added to the demands of the headlights, dash lights, tail lights, and ignition system, the total may be greater than the maximum generator output, especially on older cars.

CAR PROPERLY AND THE BATTERY WILL SERVE YOU MUCH LONGER.

... And don't forget the ignition. (It's silly, but a driver often does) ...

... Depress the clutch and you finally are ready to touch the starter button.

If your battery is low, switch to parking lights when held up in traffic.

When possible, park your car on a hill and start the engine by coasting.

