

# Popular Science

MONTHLY *Founded 1872*

*July*  
*1929*  
*25 cents*

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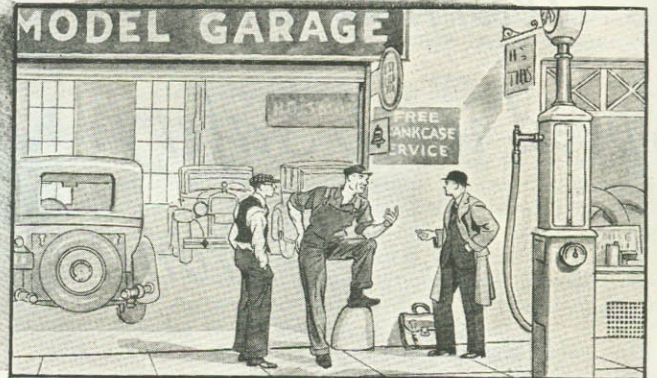
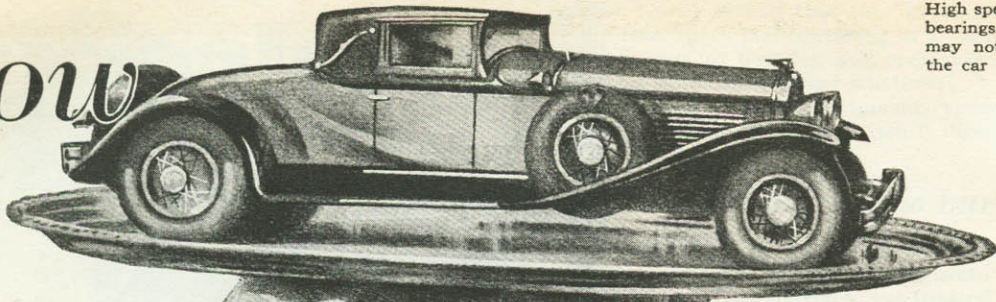


**New Ideas:** Aviation - Radio - Automobiles - Home Building  
Engineering - Exploration and The Home Workshop



# How to Break-In Your New Car

High speed takes the life out of the bearings of a new car. The damage may not show itself at once, but the car grows old before its time.



"Stay under twenty miles an hour for the first fifty miles," Gus said, "and don't do over twenty-five until you've gone 500 miles."

*It's a Temptation to Try Her Speed, Says Gus—  
But if You Hope to Keep Her Smooth and Quiet, Go Gently*

By MARTIN BUNN

"HAVE I got to sue out a writ of habeas corpus to get my car, Mr. Wilson?" smiled young Webb, the town's newest lawyer, as he poked his head in the door of the Model Garage.

"You can habeas the corpus right now, far as I'm concerned," growled Gus Wilson, veteran auto mechanic, as he wiped the perspiration from his face. "But by rights, I really ought to call in the coroner and have him hold an inquest over that particular corpus. Honest, Webb, I've done the best I could short of completely rebuilding it. It's running now, but I'm not guaranteeing it. Better get a new boat before that one falls to pieces and leaves you sitting in the road!"

"That's precisely what I'm going to do," Webb chuckled as he climbed into his ancient car. "I've placed the order already. Going to take delivery month after next, the day before I get married, and we're going on our honeymoon in the new car."

"Why the delay?" Gus asked. "Can't they make delivery before that?"

"Certainly they can," Webb replied, "any time I say. But I thought it would be nice to have

a brand-new car to start the trip."

"That's bum dope," grunted Gus. "First place you ought to drive a new car real slow for the first thousand miles, and that would be a nuisance on a tour. Besides, little troubles may develop in a new car during the first thousand miles. Anything wrong in the assembly or adjustment usually shows up then. Better get the car as soon as you can and work it in before you start the trip."

"You've made out a prima facie case,

Gus," Webb admitted. "I'll tell the agent I want the car now."

Two weeks later the young lawyer drove up in a brand-new coupe.

"Well, gentlemen of the jury, what's your verdict?" he grinned.

"Looks good—now," Gus commented. "I hope you'll keep it that way."

"Status quo, as it were," agreed Webb. "That's what I want to do if you'll show me how. First off, I'll issue a restraining

order against jamming the throttle against the floor boards to see how fast she'll go. Why is it so necessary to drive a car easy at the start. Don't the parts fit?"

"Certainly they do," Gus replied. "It isn't that at all. It's a matter of surfaces. The walls of the cylinders or the bearings on the crank shaft, for instance, look smooth and polished, but if you could see 'em under a microscope, you'd be surprised how rough they really are—full of little ridges and valleys and pits."

"But I thought the oil kept the surfaces from touching each other," Webb interrupted.

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## Ask Gus—He Knows

"YOUR ears can help you keep your car in shape. With a little training, they'll sort out the harmless squeaks and rattles from other sounds that tell of trouble. Tune your ears to the music of a sweet running machine, and when some part plays a sour note, you can't help noticing it. For instance, if there's an unusual hum or growl from the rear end, probably the ring gear is coming loose. A grating click that keeps time with the motor would tell that perhaps there's a tooth busted off the pinion."





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## Why Is Perpetual Motion Impossible?

(Continued from page 55)

is the radium clock devised by Lord Rayleigh, of England. It is designed to run, without being touched by human hands, for a thousand years. A speck of radium was placed in a small glass tube in a vacuum bulb. Rays carrying negative electrical charges are given off by the radium, which remains positively charged. The gradual accumulations of negative electricity cause two gold leaves to move toward the positively charged radium in the glass tube. When they touch the tube, their charge disappears and they return to their former position. Every three minutes the leaves move, thus keeping perfect time; this is expected to continue as long as the radium lasts.

Such devices, of course, are not true perpetual motion machines, for they are not creating the energy they need, but are merely using energy already in the world. In this same category are "self-winding clocks" which are kept going by barometric or temperature changes, and also the schemes to harness the tides or, as planned by the noted French physicist, Georges Claude, to produce power by using the difference in temperature of ocean water at the surface and at great depths.

Along with those who have been deluded into thinking they have discovered perpetual motion are those who deliberately set out to hoax the public, often selling stock in their fake devices. Famous among such hoaxes was the mechanism exhibited in Philadelphia by Charles Redheffer a little more than a century ago. It created such excitement that the legislature of Pennsylvania appointed a commission of eminent engineers to examine it.

At the appointed time, the commission arrived at the house where the wonder was kept. They found the house locked. Examining the machine through a barred window, they saw a vertical shaft carrying a horizontal disk

on which two inclined planes bore weighted cars that descended and rose at certain points in the rotation of the disk. The horizontal disk was a spur wheel and the teeth in its edge engaged with those of a smaller wheel which, ostensibly, drove the rest of the machinery.

A small boy, who had tagged along with the learned men, spied something that the commissioners missed.

"Look!" he shouted. "The wear is on the wrong side of the cogs!"

Sure enough, the wear on the cogwheels showed that the device was running backwards. The small wheel was driving the larger. Although the source of propulsion was not discovered, the deception was unmistakable.

Redheffer disappeared, but the following year he blossomed forth in New York where he attracted great crowds with a duplicate of his device. This time the keen ears of Robert Fulton, inventor of the steamship, tripped him. Fulton stood in the crowd before the machine for a moment and then exclaimed: "Why, this is being turned by a crank!"

To his practiced ears the uneven motion of the revolving wheel proclaimed that the machine was actuated by a crank. The crowd searched the house and in a second-story loft discovered a tired old man holding a piece of bread in one hand and patiently turning a crank with the other. Catgut strings running through the walls connected the crank and the machine.

Since 1811, the U. S. Patent Office has told those who submitted plans for perpetual motion machines that the building of such devices should not be attempted "until the sun rises in the west." It refuses to consider any application for such a patent unless it is accompanied by a working model. Needless to say no patents have been granted.

## How to Break In Your New Car

(Continued from page 84)

"Theoretically it should," Gus explained, "but actually it doesn't. If you don't believe it, connect an electric doorbell in series with a battery, touch one of the wires to the crank case, and let the other rub against the exposed end of the crank shaft while the motor is running. You'll find the bell will ring almost as steadily as if the wires were hitched to each other. The crank shaft is spinning in bearings supposed to be flooded with oil, yet the bell rings—proving there's a real metal-to-metal contact at some point.

"What do you suppose happens when the tiny metal ridges on the shaft bump into the microscopic rough spots on the bearing surfaces?" Gus asked.

"They commit assault and battery, I suppose," suggested Webb.

"That's exactly what they do, if—" and Gus paused significantly—"they come together at high speed. If the little ridges and points rub together at slow speed in the presence of plenty of oil, they just wear each other till there aren't any ridges left. But when they slam together at high speed they tear loose and leave the surface rougher than before. It takes the life right out of the bearings. The damage may not show right away, but the car will grow old before their time."

"How slow ought I to drive?" Webb asked.

"I'd stay under twenty miles an hour for the first fifty miles or so," Gus advised. "Then don't do over twenty-five until you've reached the 500-mile mark, and not over thirty till you've passed 1,000 miles. And no quick get-aways. Be gentle. Let the clutch in easy, don't jam on the brakes, and don't do any rip-snorting up the hills in second speed."

"I can see where I get a chance to enjoy the scenery for a while," Webb laughed.

"What's the rest of the bill of particulars?"

"Drain the crank case and put in new oil at the end of 250 miles," he added. "Even if the car has an oil filter it's worth while, because until the piston rings get worked in, raw gasoline gets past them into the crank case. Have the rear wheels tightened at the end of 500 miles. Then get 'em properly seated and you won't have any more trouble. Let 'em stay loose and you're liable to bust an axle when you least expect it.

"One thing we ought to do right now is add about a pint of oil to the gasoline in the tank. It'll give a little extra lubrication to the cylinder walls and piston rings while they're wearing in. After you've covered a thousand miles, you want to go over the car and check the tightness of every bolt and nut. Also readjust the clearance of the valve tappets. The brakes ought to be tested to make sure they're holding evenly after the brake lining has had a chance to wear in.

"That's about all, outside of the usual precautions about keeping the car greased and oiled," Gus concluded. "After that first thousand miles, though, when you first start burning up the road, it pays not to keep the car traveling at high speed for long stretches at a time. About every mile or so take your foot off the throttle for a few seconds—just long enough to let the car slow down to normal speed. That'll give the oil film on the cylinder walls a chance to renew itself.

"If you stayed in this shop awhile you'd soon see how many sets of piston rings I have to replace, how many scored cylinder walls have to be honed or reground, how many connecting rods get loose or burn out—just because dumb-bell owners step on it while their cars are brand-new!"