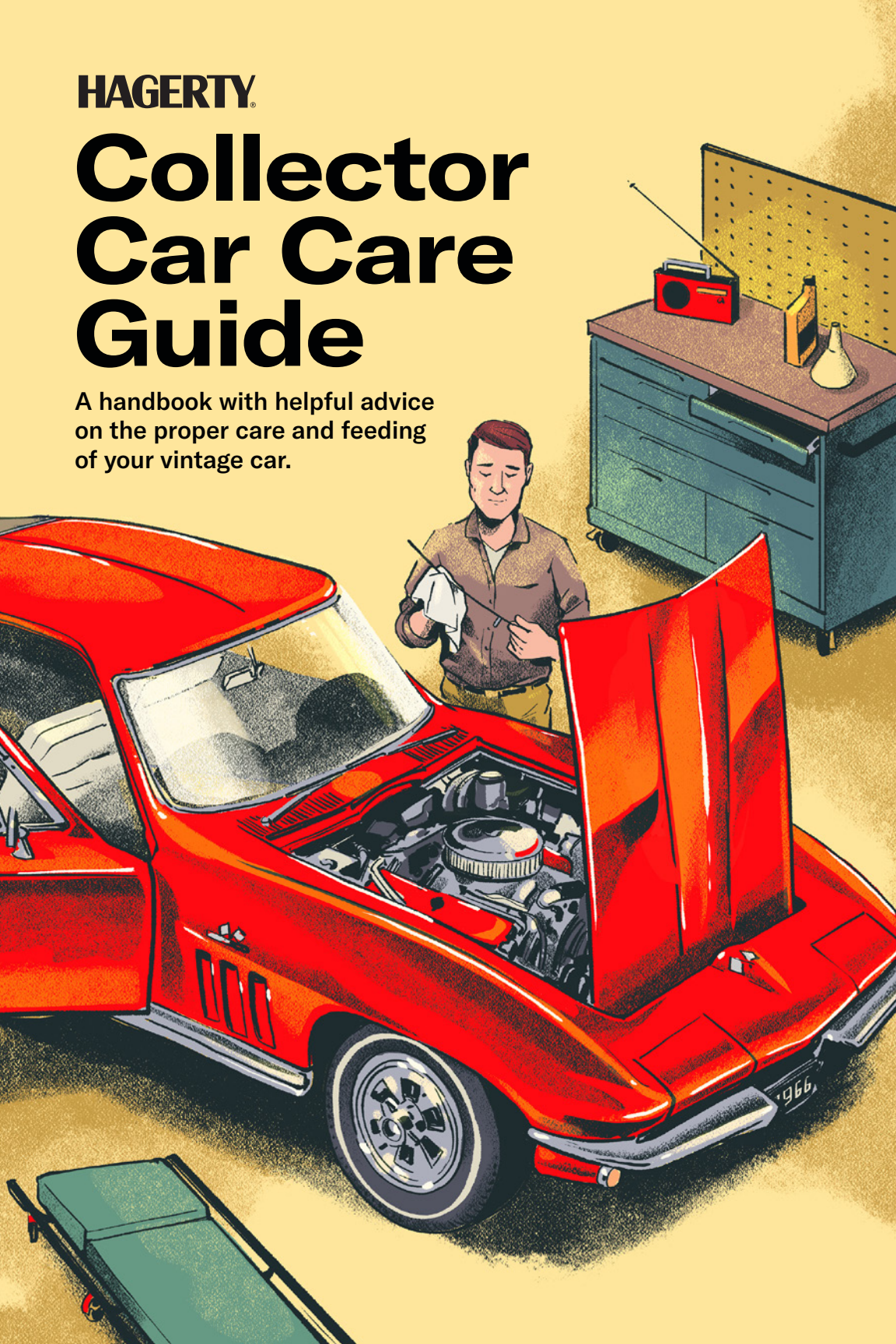
HAGERTY

Collector Car Care Guide

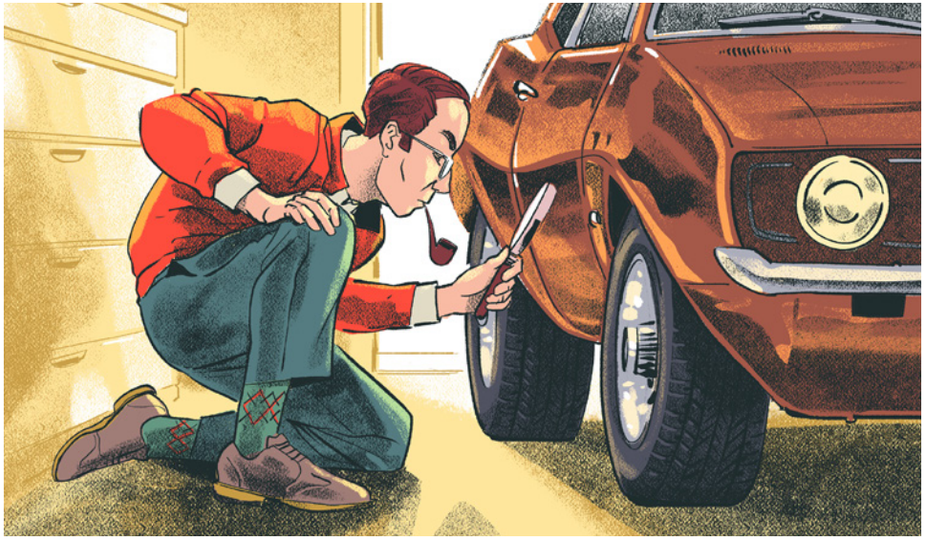
A handbook with helpful advice on the proper care and feeding of your vintage car.



Welcome!

So you've got a vintage car? Welcome to the club! In our quest to keep these pieces of automotive history alive, we've learned a few things about maintaining old cars in the modern age. That extends to helping you make sure your classic iron is in top shape. Our mission here at Hagerty is very simple: to save driving. As part of that mission, we preserve and maintain a fleet of more than 50 vintage cars, trucks, and motorcycles in our hometown headquarters in Traverse City, Michigan. It's a wide and varied assortment, ranging from a 1915 Ford Model T to a 1937 Packard to a 1965 Ford Mustang to a 1986 Porsche 944 Turbo. The collection is housed in a clubhouse/garage, which is fully outfitted with all the necessary tools and equipment for maintenance, restoration, and repairs; we also have a staff of techs and craftspeople with decades of experience dedicated to keeping everything in running condition.

As you might imagine, our staff knows a bit about the art of vintage-vehicle maintenance and the challenges it can present. That's why we decided to produce this booklet, so we can share the knowledge and experience we've accrued over the years. From tips on what oil to use to how to store your car during the off-season, think of this as our way of helping you to get out of the garage and get on the road.



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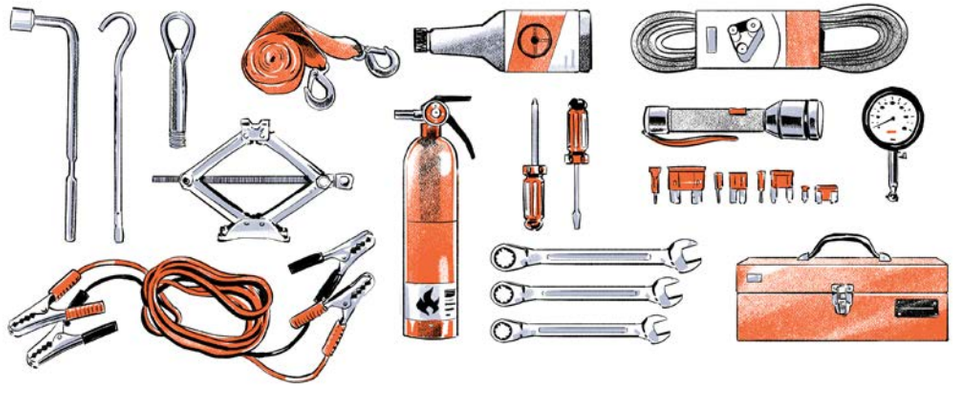
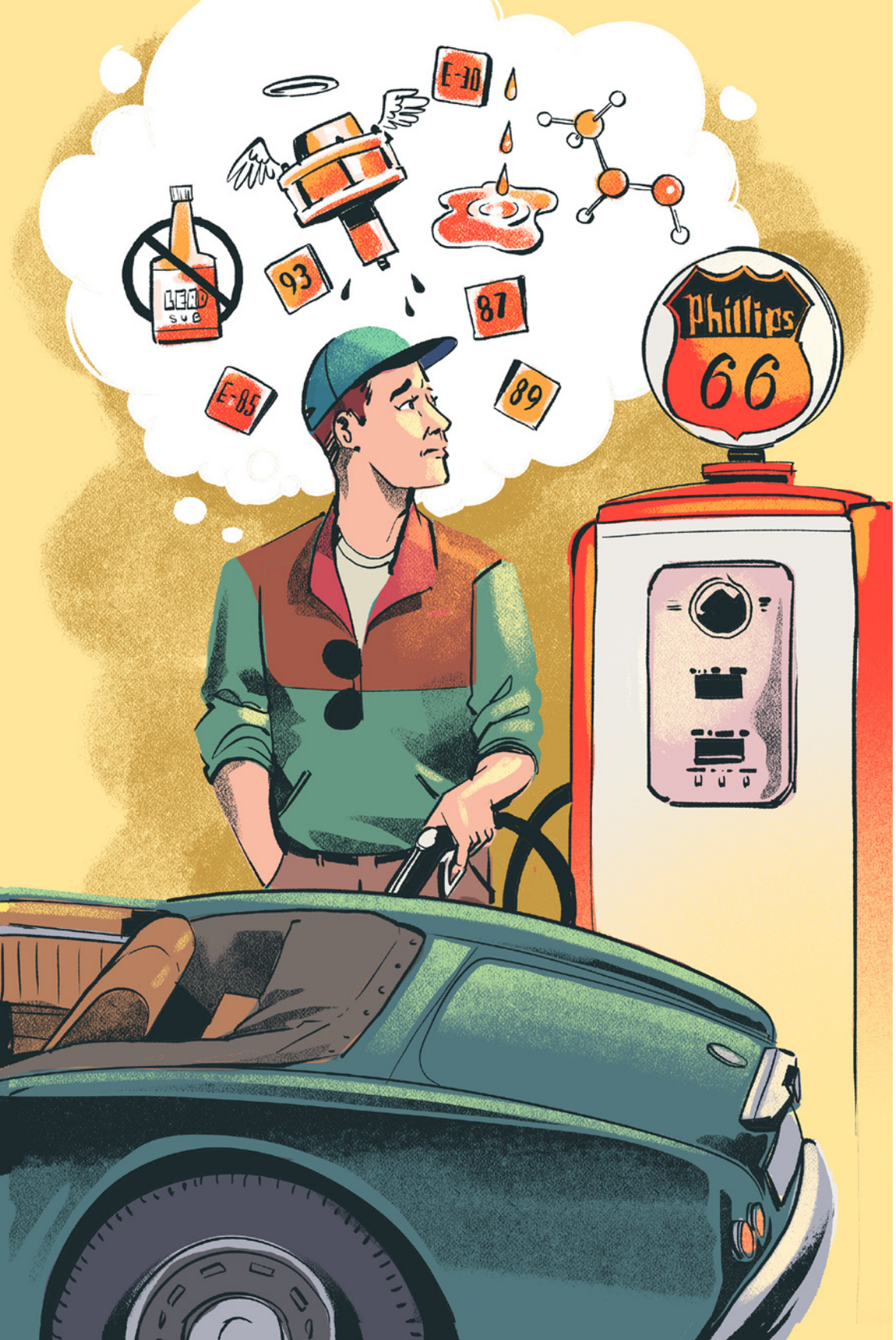


Illustrations by Charlie Layton



Fuelish Thoughts

When it comes to your vintage car, it's critical that you properly maintain its fuel system and use the best-quality gas available. There are five basic facts you need to know about today's gasoline and how it can affect the proper operation of your vintage car.

- Have Zero Tolerance for Fuel Leaks
- Ethanol Can Cause Issues in Older Cars
- Gas Has an Expiration Date
- Don't Buy Lead Additives; Do Buy Premium Gas
- Fuel Pumps Can Die, but You Can Save Them

You should have zero tolerance for fuel leaks: Gasoline isn't like oil or antifreeze. It's not OK to have a few drops of gas beneath the car as long as they don't get bigger. If you smell gas, you need to find the leak and fix it before you drive the car again. Often, it's just the end of a section of rubber fuel line that can, if necessary, be trimmed and re-clamped. But if it's from a rotted metal fuel line or from the rusted seam of a gas tank, then you have some pain and expense ahead of you to fix them properly.

Ethanol in gas is an issue in older cars: Depending on the state or the region, every gallon of gas may contain 10 percent to 15 percent of government-mandated ethanol, an alcohol that is derived mostly from corn. The most common gasoline/ethanol blend is E10. This refers to a blend of gasoline that has 10 percent ethanol in it and is sold at most gas stations around the country. E15, which contains 15 percent ethanol, is found in some areas. Corrosion problems are exacerbated in vintage cars that aren't driven frequently, have steel fuel tanks that can rust, and have tanks that are poorly sealed, either by design or due to degraded or missing emissions-system components. Moisture-laden air enters

the gas tank; the ethanol in the gas absorbs the moisture and creates an ethanol/water solution that accumulates at the bottom of the tank. The water in the solution then rusts the tank, and a combination of water and corrosion causes rough engine operation due to plugged fuel filters, fuel injectors, or carburetors.

Ethanol can attack rubber fuel lines, seals, gaskets, and older sealant material as well as other soft fuel-system parts such as carburetor floats and diaphragms. If you haven't replaced your original rubber fuel lines with modern ethanol-resistant ones, you should do so. Rubber lines crack on the inside from fuel and on the outside from age. If you hear the line crack when you flex it, the line is bad and should be replaced. Fuel lines on German cars are especially critical as their fuel pressures can be as high as 40 psi. These lines can rot from the inside, and when they develop cracks, they can cause an explosive vapor leak. These lines are not ethanol safe, so replace them, especially if your car is more than 20 years old. Check clamps by making sure they are tight and not leaking. Use a screwdriver to tighten them. If they continue leaking, replace them.

You should seek out ethanol-free gas, which is often labeled as "recreational gas" or "rec gas" because it is intended for use in recreational/marine engines that can be damaged by ethanol found in other gas blends. Availability varies from state to state. Websites such as Pure-Gas.org and BuyRealGas.com assist in locating ethanol-free fuel.

Gas has an expiration date: Before you store your car for more than a month, it's wise to add fuel stabilizer such as Stabil or Sea Foam to the tank and then fill it with gas. However, this only prevents the gasoline from going "sour." It doesn't alter ethanol's water-attracting properties or cause water that has already formed in the gas to magically dissolve. Adding a different alcohol, isopropanol (also known as isopropyl alcohol), makes the water soluble in gasoline when used in a ratio of 2 percent by volume of isopropanol to gas. This helps carry it through the combustion process. As a reference point, Fiat Chrysler forbids use of methanol-containing fuel additives in its products, so it is important to read the label. For example, HEET brand fuel additive comes in both methanol and isopropanol formulations. Only use the isopropanol version.

It's a good idea to completely fill the gas tank before storage, as this eliminates the air space where condensation can occur as exterior temperatures fluctuate. Take this consideration as a justification to use the entire tankful on an extended pleasure drive when you pull the car out of storage.

Aging gasoline rarely becomes an issue over the course of a month or so, but letting gas sit longer can have undesirable consequences. If you open up the gas tank and catch a whiff of that varnish smell, the gas will need to be drained. As gasoline sits longer, the fuel will leave behind a gummy residue that will need to be removed professionally.

Don't buy lead-replacement additives; do buy premium gas: Conventional wisdom says that the lead in leaded gasoline protected valve seats, stems, and guides, which many owners of pre-1976 cars try to address by using lead-replacement additives. It is true that receding valve seats were recognized as an issue with the phaseout of leaded gasoline. However, that was not due to the absence of lead, but rather due to lower octane ratings. The Environmental Protection Agency's mandated shift in gasoline-octane-reporting schemes added to the confusion. Engine valves don't need any more protection than a higher grade of gasoline provides. So-called "lead additives" are generally ineffective in boosting octane or protecting the valvetrain. When it's time for a valve job, use hardened valve seats, because they will last longer and won't be damaged when you aren't able to use high-octane gas.

There are two aspects to gasoline quality: the blend stocks and the additive package. EPA rules have minimized the variability in blend stocks to some extent. Though the EPA only sets minimums for the deposit control additive (DCA) package, the EPA does recognize superior DCA performance with the Top Tier designation for gas, which will appear on the pump. It's a pretty safe bet that the companies that care enough about quality to spend money to achieve Top Tier are also investing in blend-stock quality as well. Top Tier doesn't have to be expensive. Sure, you can find it at Chevron or Texaco stations, but in many markets, ARCO or Costco gasoline can be Top Tier as well—look for it on the pump!

Fuel pumps can die, but you can save them: Carbureted cars usually have a mechanical fuel pump that uses a rubber diaphragm. With age, the rubber loses its elasticity. This can first manifest itself in the car being very difficult to start after sitting, as the pump has trouble filling the fuel lines and the carburetor's float bowl. Eventually the pump stops working completely. Electric fuel pumps usually fail in a more binary way—they either work or they don't. Sometimes pumps get clogged by rust from the gas tank that finds its way into the rest of the fuel system. In either case, the symptom is a car that starts but dies a few seconds later. The fuel pump is usually the culprit.

Cars with internal fuel pumps in the fuel tank rely on the fuel to cool the pump. If you normally keep the tank one-quarter full or less (which is understandable perhaps for a car not driven often), you do not have enough fuel to keep the pump cool. As the pump ages, it becomes more susceptible to cooling-related failure, so keep the tank at least half full.

Your Car's Oil

Oil is the lifeblood of any engine. And just as there are different blood types, so there are different types of oil for different engines, uses, and climate conditions. Though there's no "one-oil-fits-all" answer, there are general guidelines you can follow. Here are some points to consider when choosing the correct lubricating oil for your vintage ride.

- Conventional or Synthetic Oil—Which Should I Use?
- How Often Should I Check My Oil?
- What about Zinc in Oil?
- What Viscosity Oil Should I Use?
- Should I Use Additives?

Stick with conventional oil versus synthetics: If the manufacturer didn't originally specify synthetic oil for your vehicle, you can use conventional oils to avoid problems. The advantages of synthetics include very high operating temperatures and long life between changes, benefits that aren't usually realized in older cars that were designed for lower operating temperatures. Oil in classic cars generally loses its lubrication quality long before it reaches the recommended mileage due to time-related oxidation and condensation and acids caused by engine combustion.

Change your vehicle's oil annually (at minimum): Most vintage cars won't reach the mileage recommendations for oil changes, so change your oil and oil filter at least once a year. Engine oils contain antioxidation additives; when you open the container, however, oxidation begins. Once the engine is started, the act of combustion contaminates the oil with condensation and combustion-byproduct acids. This underlies the lubricant maker's suggestion to change oil at least every four months, no matter how many miles are driven.

Change your oil right before you store your car. This ensures that the oil is free of moisture and acids, which you don't want sitting in the engine while the car is in storage.

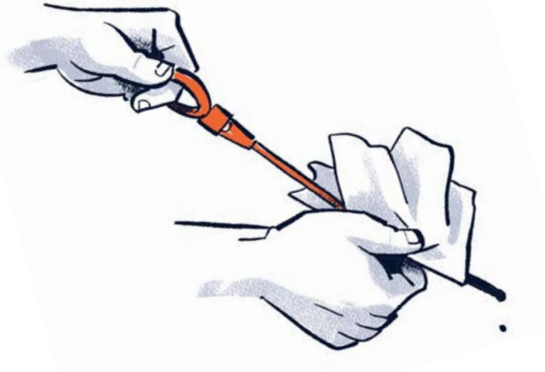
Choose the correct viscosity of engine oil: Thin (lower viscosity) oil can flow more freely and faster. This is critical when you start a cold engine, when it is pumping oil from the bottom of the engine up into its moving parts. The oil needs to quickly reach those parts to lubricate them; low-viscosity oil allows this. When the engine is hot, you don't want oil to be *too* thin. Thus, thick (higher viscosity) oil keeps engine parts lubricated and prevents friction that causes wear.

The Society of Automotive Engineers (SAE) developed a scale to measure oil viscosity. The scale ranges from 0W, which represents the thinnest type of oil, to a rating of 60, which represents the thickest oil. The "W" on oil labels represents the word "winter," which represents how thick the oil is when an engine is cold. The "10W30" designation means that the viscosity of the oil is rated at 10 when an engine is cold and 30 when the engine is hot. This is different from an oil labeled 5W30; the 5 means the oil is thinner when the engine is cold. In hotter climates, you will want to run oil with higher viscosity numbers; in colder climates, you'll want to run oil with lower viscosity numbers.

Begin by researching your engine's original viscosity specification. Perhaps you don't have the original manual that came with your car, but someone has likely uploaded it online.

Check your oil level before you drive: We're not in favor of adding oil every time the level changes minutely, but at least top up when the oil level drops by a half-quart. If you've been doing mostly around-town driving, the oil will have more combustion-byproduct condensation due to lower operating temperatures. Don't be surprised if you have to add oil after a freeway run that boils off that condensation.

How to Check Your Oil



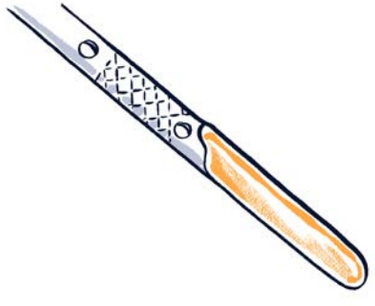
1. *With the engine off for at least a few minutes and the car parked on level ground, pull out the dipstick and wipe clean from top to bottom with a clean rag or paper towel.*

2. *Reinsert dipstick and be sure to seat it completely for an accurate reading. Pull out the dipstick again—this time without wiping.*

Choose the zinc level of your oil carefully: Modern oils do require modification to meet the needs of older engines. One alternative is to select a diesel-spec oil such as Shell Rotella with zinc dialkyldithiophosphate (ZDDP) or racing oil such as Valvoline VR1, Pennzoil GT, and Driven Racing Oil. ZDDP is the most commonly used antiwear additive in engine oils, expressed on the label either as a percentage or in parts per million (ppm). The ZDDP compound forms a protective layer on steel in the presence of pressure and temperature, preventing metal-to-metal contact. In classic-car engines, this is most important to mitigate sliding wear in their valvetrains. Zinc can damage the catalytic converters in cars built after 1975, so modern engine oils have dramatically reduced levels.

Don't assume that more zinc is better, and don't choose oil with a high content of ZDDP or top off a high-zinc oil by using even more ZDDP additives that are sold separately by companies such as ZDDPlus, Lucas, or Rev-X. Too much zinc in the oil causes bearing corrosion, sludging, and spark-plug-fouling problems.

Consider alternative additives: Many "mechanic-in-a-can" solutions are available; some have been around for years. Many offer no benefit, being composed of light-weight oil, fragrance, and coloring. There are some additives that are derived from modern lubrication science, but it's always wise to investigate the claims behind any offering. One additive worth your investigation is ASL CamGuard, which is touted to reduce wear, control corrosion, protect highly loaded surfaces, and extend the life of engine seals. The formulation comes out of work done at a major petroleum company but was deemed too expensive for inclusion in its engine oils. For our classic cars and their special needs, however, there are some real advantages. Those who have their engines on oil analysis report reduced wear of metals, and that is promising. It may be possible to sidestep choosing the right level of zinc in your engine oil by including this alternative instead.



3. *Check both the level and color of the oil. Healthy oil is golden/amber, dirty oil is dark brown/black. Dipsticks differ but usually have markings that denote a 1-quart range where your oil level should rest. If below that range, add a quart.*

4. *Use a funnel to keep things clean on your engine, and don't overfill beyond the FULL marking.*

All Charged Up

As with so many things in life, you only become aware of a battery when it fails to do its job. That heavy plastic box in your engine compartment (or in the trunk, or under the floorboard if it's a car built before the 1960s) is as vital a component to the functioning of your car as its engine. Often the battery is completely overlooked until it dies. Car batteries don't have to die as frequently as they do, however, and sometimes even when they're "dead," they can be brought back to life.

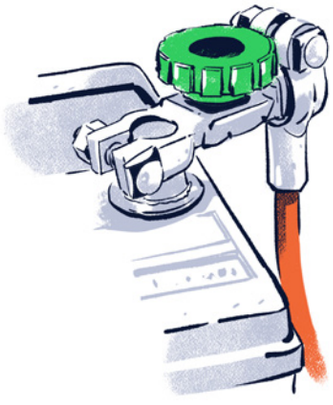
- Battery Basics
- Installing a Cutoff Switch
- Keep Connections Clean
- Using a Battery/Trickle Charger
- Jump-Starting

Let's start with the basics: A battery is an energy bank into which the charging system makes both deposits and withdrawals as needed. A car battery also serves other functions. It acts as a buffer in the electrical system by smoothing out the peaks and valleys in the voltage, so that the electrical devices receive a uniform amount of energy at all times. The battery powers the car's electrical systems when the engine isn't running. In addition, it stores electricity for when the car is parked, so it will have juice later for a restart.

You can't depend on your car's charging system to fully recharge a dying battery. The charging system in your car wasn't designed to bring the battery back from the dead; its purpose is to supply a maintenance charge to the battery while the car is underway. If it seems as though your starter is chug-chugging the engine to life with barely enough juice to get it started, then your battery is weak and you are putting undue stress on the charging system. Ignore this situation and soon you will be shopping for a new generator/alternator as well as a new battery—or, worse yet, stuck on the side of the road or in some lonely, dark parking lot.

Ways You Can Extend Your Battery Life

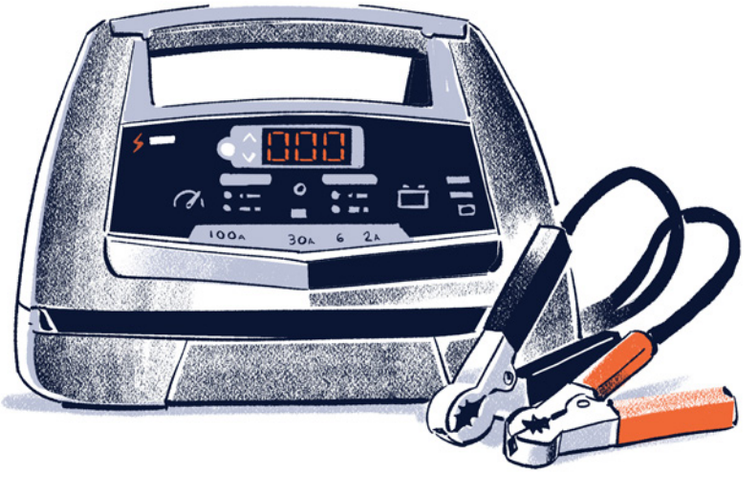
Installing a cutoff switch: Several types are available, from cheap screw-type switches that bolt directly to the battery post to heavy-duty marine switches. Car batteries have a shocking amount of power and can easily start fires if metal bits are touching each other in the right way. Some people have had good luck with the inexpensive screw-type disconnectors—the kind typically with a green knob—yet others prefer using marine-rated shutoffs.



Disconnecting the battery eliminates the possibility of a major short causing a fire. It also keeps the battery from suffering a slow death through more common low-amperage draws, which are prevalent in old cars with aging wires.

Keep connections clean: Check your battery connections for corrosion. If you spot a crusty white residue, disconnect the cables and clean the battery posts and clamps by using a mixture of 1 cup of baking soda and 1 cup of hot water. Scrub the posts with the solution using an old toothbrush. The baking soda neutralizes the toxic sulfuric acid in that corrosive white buildup on the posts. When done, dry off both posts and apply some petroleum jelly or lithium grease to keep them insulated and prevent future corrosion.

Using a battery/trickle charger: A trickle charger provides a steady low-amperage charge to the battery; a more sophisticated float charger senses when the battery is starting to discharge, then applies a charge to the battery until it is topped up again, at which point it switches off. A discharged battery can freeze, so either keep it on a charger when stored in winter or remove the battery and store inside.



Trickle chargers come with downsides as well. Cheap ones can overcharge the battery and cause fires. Check the internet for horror stories and photos if you don't believe it. Trickle chargers without internal float controls also can ruin batteries when left on for a long time, thus killing the thing that they are meant to be saving.

Any time an external power source is connected to your battery and you are not there to physically monitor it, there is a risk. You can allay the risk by buying a high-quality charger, buying one that matches the type of battery you have, or by having a set time once every six months to fully charge your car's battery. Your battery will thank you for the attention, but the best way to keep your battery healthy is to drive your car regularly.

Some things to know about battery chargers: If you have a charger that is more than 10 years old, stop using it. Old chargers have aging wiring and no modern controls to prevent overcharging. You're risking a fire every time you use it. Overcharging a lead-acid battery produces hydrogen-sulfide gas, which is flammable and toxic.

Some chargers allow you to select deep-cycle or maintenance charging. Your car battery is not a deep-cycle battery; it's designed to have a certain level of charge at all times. Hence, maintenance charging is a better choice for a car battery.

Jump-Starting

Jump-starting your collector car: Some chargers have a jump-start function, which means they can briefly supply high current to the battery to get the engine started without waiting for a lengthy charge. However, a battery in need of a jump-start is a battery either in need of a full charge or possibly replacement. If you find yourself jump-starting your car's battery often, then even if it has enough juice to run the car for a while, it's going to need replacing soon.

Tools for the Road

A road trip in your vintage car is fun; breaking down on that road trip is not. To make sure you're prepared when that happens, we have compiled a list of useful items that everyone should carry in their vehicle.

- Safety First: Protect Yourself and Your Car
- Fluids You Should Carry
- Spare No Expense on Your Spare
- Packing a Tool Bag
- Longer Drives? Extra Parts to Take Along

Safety First

Fire extinguisher: Not kept in the trunk but secured in the cabin or under the front seat and accessible at a moment's notice. We recommend the Element brand of fire extinguishers, because they are small enough to fit in the glove box and are light enough to be wielded easily. An E50 model will discharge for 50 seconds, which is almost five times the duration offered by a standard 5-pound bottle-type fire extinguisher. Check your fire extinguisher annually to verify that it is charged.

Reflective safety triangle/flares: Carry a reflective safety triangle or flares to place behind your vehicle so oncoming traffic can see you in the event of a breakdown.

Spare Fluids

Oil: Carry two spare quarts and you won't be left scrambling for the type you need in the middle of nowhere. If your car needs more than a quart per 500 miles, it might be a sign of internal engine wear, which tends to make itself evident in unpleasant ways, e.g., the engine going *boom*.

Coolant: The same theory regarding oil applies to coolant. You don't want to be pouring bottles of Evian into your radiator if your car overheats, so carry an extra gallon of coolant.

Vital fluids: While we're on the subject of fluids, consider also packing the appropriate fluids for the automatic transmission, brakes, and power steering.

Packing a Tool Bag

Tools: We recommend having a soft-sided tool bag that is dedicated specifically for your car, stocked with a selection of items. Here are a few we suggest:

- Screwdrivers (both flat and Phillips)
- A ratchet and sockets (both regular and metric sizes)
- Ball-peen hammer
- Selection of fuses
- Wrenches
- Pliers
- Adjustable wrench
- Pry bar
- Wire cutters
- Zip ties
- A flashlight and/or a headlamp
- Duct tape/electrical tape
- Paper towels/shop rags
- Waterless hand wash
- Wheel chocks

You don't want to be the guy standing on the side of the road shouting, "My kingdom for a Phillips screwdriver!" Also pack a rubber mallet for whacking a sticking starter or reinstalling wheel covers. The well-maintained classic should have no need for jumper cables, but carrying them is advisable. And if you know how to use one, a compact electrical tester can help isolate roadside gremlins.

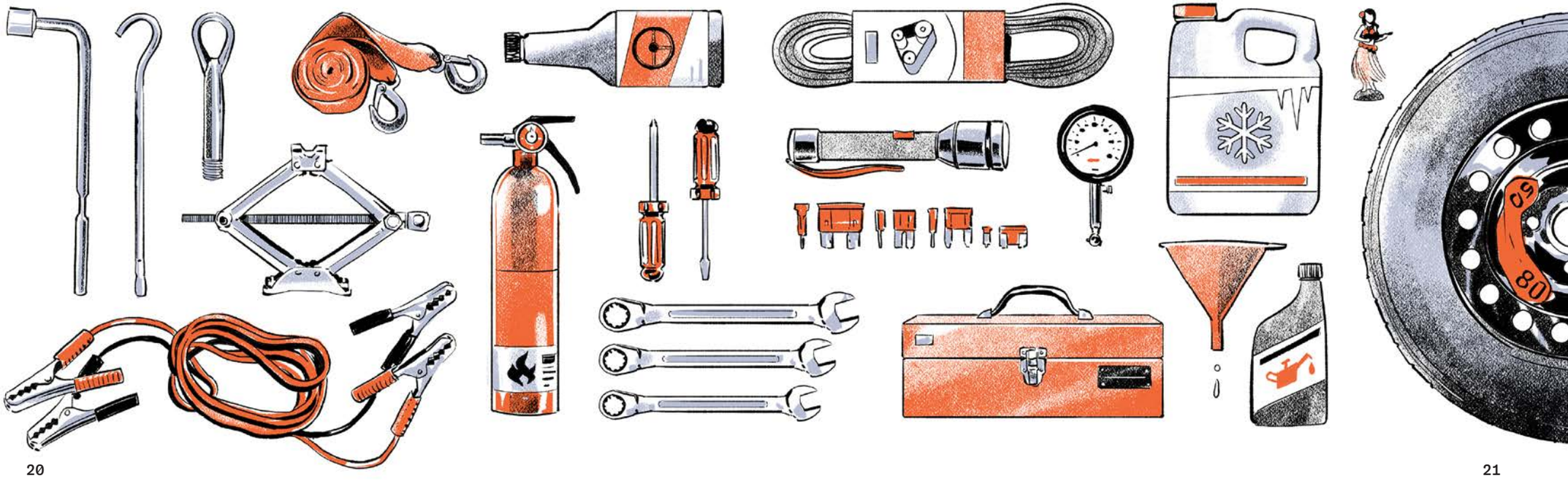
Spare Tire & Jack

Tires: Of course, you have set the tire pressures before your trip, but using a tire-pressure gauge can help you determine a slow leak and prevent a flat. We recommend old-school gauges that don't use a battery; a digital gauge's battery can die right when you need it. And speaking of flats: A functional spare tire, fully inflated, and of the same size and type as the road tires, is best. And if all the parts of the car jack are not present and accounted for, pack a portable car jack. There are even electric ones available.

Parts for Road Trips?

Consumables: Many cars have a fuel filter in the fuel line, and it wouldn't hurt to carry a fresh one. And, of course, fuses. There are three basic fuse styles: glass for domestic cars up to about 1982, barrel for older European cars, and blade type for the 1980s and newer. Whichever style your car uses, it's peace of mind to pack a few spares. It's always handy to have a length of wire with a couple alligator clips for jumping a misbehaving wire, too.

Longer touring: For long-distance road trips, an extra set of belts can save the day. Some people carry extra water pumps and fuel pumps. Even if you don't plan to install them yourself, having the parts with you will certainly expedite the repair process, especially if your vehicle is rare or you're stranded far from civilization.



Where the Rubber Meets the Road

Tires are essential to the safety and performance of any vehicle. It's critical that you know the condition of your tires, how old they are, and that they are properly inflated. This is especially true if you recently bought your collector car; tires are expensive, and it's possible that the previous owner has skipped replacing them in an effort to economize. Here's what to check.

- Inspecting Your Tires
- Are They Safe? Tread Depth and Age
- Proper Inflation

Inspecting your tires: Does passing the penny tread-depth test (i.e., flipping Lincoln's head upside down, inserting the penny in the tread, and ensuring his head is not fully exposed—about 2/32 of an inch) and checking tire pressures mean you are ready to go for a trip in your classic? Not yet, as old cars with old tires are a dangerous combination.

Both aforementioned tests are important, but a visual inspection is likely to save you and your classic from harm. As a result, consider two other items when inspecting your tires: the date code and the rubber's physical condition.

Determine the age of the tires: The tire-identification number starts with the letters "DOT," followed by letters and numbers; locate the last four numbers in the code. The first two digits represent the week the tire was made and the last two represent the year. For example, "4320" means the tire was made in the 43rd week of 2020. The general consensus of tire and auto manufacturers is that tires have a life span between six and 10 years. If your tires do not have a date code, they should be replaced immediately.

Not all driving conditions are equal. Exposure to sunlight (UV rays), ozone, and high temperatures exacerbate the breakdown of rubber, and the most visible symptoms are cracks in the sidewall and between the tread blocks. But that's not all: Dry-rotted tires free of cracks are still hard, dark gray, and negatively affect ride and handling, especially in wet weather.

Proper inflation: Newer vehicles run higher pressures than older vehicles, so don't inflate your classic's tires without confirming the correct pressure in the manual or on the label in the driver's-side doorjamb. For older cars (prior to 2003), tire pressures can be located inside the glove-box door, the fuel-filler door, or trunklid. Don't use the pressure molded into the tire sidewall. This is the tire's full rated-load capacity, not the pressure specified for your particular vehicle.

Preventive Maintenance

Ongoing care of your four-wheeled friend is essential. While that old saying that accidents will happen is true, there are some situations where catastrophes can be all but eliminated if you know how to spot them before they can turn tragic. Here at Hagerty, we have seen owners experience damage to their beloved vehicles that could have been avoided if the owners had a bit of knowledge and knew where to look. Consider these tips our way of sharing lessons learned the hard way by others to help you enjoy trouble-free driving for many miles.

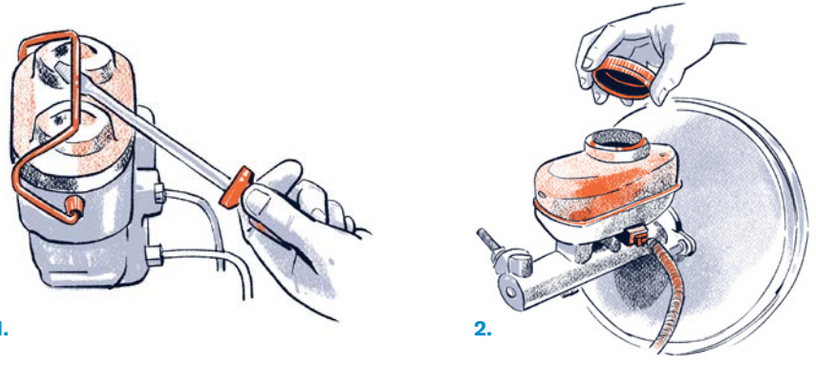
- Check under the Hood
- Take a Stroll around Your Car
- What to Have Your Mechanic Check

Check fluid levels: Start your journey by first checking your car's fluid levels, regardless of how long or short of a drive you are taking. While the engine is still cold, check the engine oil and coolant, the power-steering fluid, and even the windshield-washer fluid. Transmission fluid should be checked when hot, so check it at the end of your drive.

Check the color of the brake fluid: Good fluid looks like apple juice. Bad fluid looks like maple syrup. When you're driving, note how the brake pedal feels when you apply the brakes. If it feels spongy, you should have your mechanic bleed/flush the brakes. Whether bleeding the brakes or just topping off the fluid, use the same specification fluid type as dictated by your owner's manual. There are three types: DOT 3, DOT 4, and DOT 5. *Never mix different types of brake fluid.*

Checking Your Brake Fluid

Before checking your brake fluid, wipe off the reservoir and cap with a clean rag to prevent any contaminants from entering the brake system. Low brake fluid can be a sign that brake pads have worn to the point of needing replacement; be sure to have your brakes checked by a professional.



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Older cars (1) usually have a metal lid on the reservoir with a clamp that needs to be released with a screwdriver. Newer cars (mid-'80s or later) often have a translucent plastic reservoir with a screw cap (2), and sometimes the fluid level is visible without opening the cap. If low, slowly add the correct fluid until it reaches the FULL marking—do not overfill. Note: Brake fluid is highly corrosive, so be careful not to get it on the car's paint or your skin and clothes.

Brakes are our friends: Going is fun—not being able to stop is not. If you are losing brake fluid, look for leaks under your car after you pull out of your garage or parking space. If you see signs of leakage, do not drive the car until you have resolved the situation. When the rubber lines collapse, they typically act as a check valve that allows the fluid to pass to the brake but not return to the cylinder. This in turn locks up the cylinder, which will cause overheating, possible fire, and loss of brake fluid. When in doubt of the age or condition of your brake lines and hoses, you should have your mechanic replace them.

Look for signs of rodents: Check inside the air cleaner; if you have an air-cooled car such as a Volkswagen Beetle or a Porsche 356, check the engine-cooling fins. If these fins are blocked, the engine will overheat and possibly cause engine damage. An inexpensive borescope can give you a good view of those hard-to-reach areas.

Check hoses and clamps: It's easy to overlook hoses and clamps. To check the condition of the rubber hoses, squeeze them and look for cracks. If the hoses are soft and pliable, they are likely in good shape. If they feel stiff or hard, they need to be replaced. Oil hoses can become soaked and will feel soft and mushy. Replace rotted hoses before they leak fluids or fumes, especially those that carry fuel to the engine. Fuel lines on German cars are especially critical as their pressures can be as high as 40 psi. These lines can rot from the inside, and when they develop cracks, they can cause an explosive vapor leak, which could start a catastrophic fire that can result in a total loss of your beloved ride. These lines are not ethanol safe, so replace them, especially if your car is more than 20 years old. Check clamps by verifying that they are tight and not leaking. Use a screwdriver to tighten them. If they continue leaking, replace them.

Check your belts: On the topic of rubber, belts can also crack and dry out, so have your mechanic change them before you're stranded on the side of the road with an overheated engine or a dead battery.

Check exterior lights: If you're planning on an evening drive or know that you will be driving in the dark, take an opportunity to check all of your exterior lights. Start at the front of your vehicle, then circle around it to the passenger side, then to the rear, then to the driver side and back to the front. You should check:

- Headlight high beams
- Headlight low beams
- Front running lights
- Front left and right turn signals
- Passenger-side marker lights
- Rear lights
- Rear left and right turn signals
- Reverse lights
- Brake lights
- License plate light

Wiper blades: These keep your vision clear in the rain, so replace them every year to keep them at peak performance. Test all speeds of the wiper motor and that the wipers will park out of your line of sight. Learning that they don't work during a rainstorm is not a good idea!

Have your gauges checked: Ask your mechanic to check that all of your gauges are working. Nobody wants to be stranded because of an inaccurate gauge, especially the oil-pressure and coolant-temperature gauges.

Wheel bearings: If not properly maintained, wheel bearings can get hot, overheat, and cause a fire. Have your mechanic make sure the bearings are packed every six to eight years as maintenance.

Properly Storing Your Car

All good things must come to an end. For those who must endure the deep cruelty of snowfall, each year you'll come to that most painful of moments (aside from April 15, of course): the end of the driving season and a long storage nap. In order to retrieve your car in the same condition you left it, follow these steps (which apply for seasonal storage regardless of climate).

- Prepare Your Storage Space
- Preventing Damage from Pests
- Fuel and Fluids for Storage
- Using a Car Cover
- Getting Out of Storage and Back on the Road

Prepare your storage space: Start by scoping out the spot where you will store the car. Your primary goal is to ensure that the bottom of the car stays dry, because moisture causes rust and rust is the enemy. Moisture can flow upward from the concrete, so the idea is to create a barrier between the concrete and the underside of the car.

First, clean the concrete as well as you can, preferably with a degreasing cleaner. Then lay down a plastic vapor barrier—the thickest one you can find. These are available in the paint department at home-improvement stores. Use duct tape to seal the edges to the floor, then put a basic cloth/canvas layer on top of that, which you also can find in the paint department of a home-improvement store.

Preventing damage from pests: Insect/rodent damage is one of the top reasons Hagerty members file claims, and in this case, a few simple steps can help avoid such misfortune. Adding these layers doesn't specifically deter rodents or insects, but if the car is on a clean surface, you can easily see if there is evidence of their activity underneath or around the car.

Think of what critters use to build homes. Is there any old furniture stored near the cars? Stuffing from pillows and chairs can be easily hijacked and made into mouse nests inside every crevice of your car. We know of one owner who had a family of mice build a lovely home in the transmission tunnel of his 1968 Porsche 911; he thought he'd never dig all that fuzz out of there, and the unpleasant odor lingered long after the mice were gone.

Many people swear by dryer sheets such as Bounce, Irish Spring soap, and mothballs to deter rodents, but we swear *at* them; their scent can potentially harm your car's interior. If you do choose to use them, we advise that you place them only on the exterior of your vehicle. Use dryer sheets in spots such as under the hood, on the tops of the tires, and even over the end of the car's exhaust tips. Make a list of all the spots where you place the dryer sheets; it's easy to forget over the course of the winter. Then, at the beginning of the driving season, gather them all up and toss them—but not in the dryer.

To keep rodents out of exhaust systems and air cleaners, put wads of steel wool inside them. We know of someone who was tearing down an engine and found a mouse carcass on top of a piston.

Mice will make nests out of almost anything, so empty your car of all paper products. Remove items such as the owner's manual or your vehicle documents (registration, proof of insurance, etc.) from the glove box. Verify that the trunk is empty, too.

On the subject of traps: Consider setting traps on the exterior of the building where you store your car to keep out rodents. If you decide to use traps inside the building, don't place them inside of your vehicle. You definitely don't want its interior to reek of rodents that have gone to that big piece of cheese in the sky.

Mice have been known to nest behind sun visors and cause damage to the visors and headliner. To avoid this, always lower the visors to eliminate the chance for the critters to establish residence behind them.

Check objects stored around your car: Falling objects damaging vehicles are also major causes of our Hagerty members filing claims. Make sure there is nothing stored within the perimeter of your vehicle or above it. Move items such as rakes, shovels, or bikes that could fall against your vehicle and cause damage.

Overinflate your tires to avoid flat spotting: Typically, 40 psi or so is enough. If you're storing it longer than a couple of months, you can jack up the car to take pressure off the tires. Check pressures when you take the car out of storage; if a tire has 30 psi or so left, that's probably acceptable leakage loss, but if it's 20 psi or lower, you'll need to remove the wheel and have a tire shop repair it.

Once you've prepped the spot where your car will be hibernating, follow these steps to be certain it's stored properly:

- Before you put your vehicle away, give it a wash and wax to protect the paint and chrome.

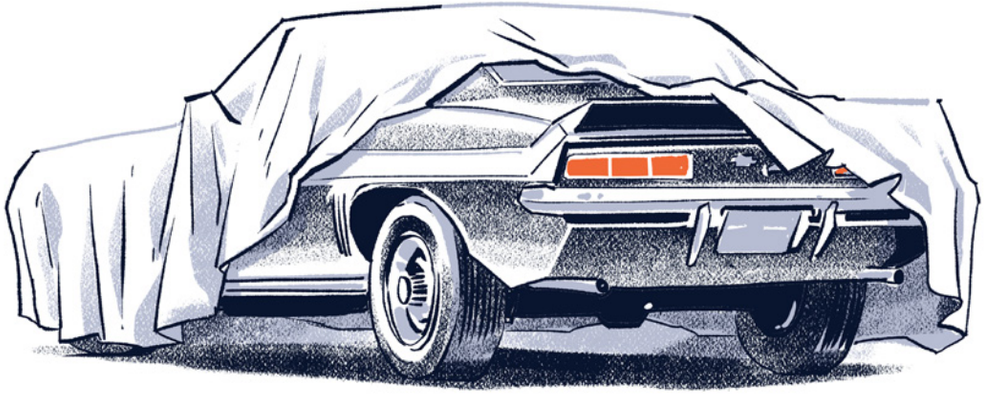
- Make your last drive of the season to a gas station, preferably right after you wash and wax it to be sure all the water is blown out of all your car's nooks and crannies. Before you head out, add a bottle of fuel preservative such as Stabil or Sea Foam to the gas tank. Taking a drive will help run the preservative through your car's fuel system. Once at the gas station, top off the gas tank. The full tank will keep out moisture, and the preservative will keep the gas from going bad.

- Change the oil before putting your vehicle in storage. You don't want to see nasty sludge in the spring; having fresh oil will mean your car will be ready to roll when driving season returns.

- If you're in a climate where temperatures drop below freezing, check that your antifreeze is fresh and topped off to avoid corrosion. Top off your windshield-wiper fluid, too, to keep it from freezing.

- Put down a few silica-gel desiccant bags to absorb moisture inside the car. Set them on plates or a similar surface so they don't sit directly on the carpet or upholstery.

- If you're storing your car for longer than a month, connect it to a smart charger. (See p. 16, in the Battery section.) A discharged battery can freeze, so either keep it on a charger when stored in winter or remove the battery and store inside.



Should you cover your car? Some owners avoid covering their car because mice like dark areas to build their nests, often using the car's insulation, hood blanket, or seat-cushioning material. Use a car cover if storing indoors; if you use one on a vehicle that you store outside, it can get whipped by the wind and seriously damage the vehicle's paint. These covers can range in price from several hundred dollars for heavy-duty breathable covers to less than $20 for thin, translucent plastic covers with elastic along the bottoms to snug up the cover once it's on the vehicle. One person can easily put it on, and since the plastic is translucent, you can see the vehicle underneath it. Seeing your car slumbering away in your garage can do your car-loving heart some good in the depths of winter.

When it comes time to awaken your car from its slumber, follow these steps before you take it out on the road to ensure it's ready to roll:

- When a car sits, the engine oil drains from the cylinders into the oil pan, leaving the engine without lubrication. At the beginning of the driving season, disconnect the power lead to the ignition coil so you can turn over the engine without starting it. If your vehicle doesn't have an oil-pressure gauge that allows you to monitor oil pressure, crank the engine over for about 10 seconds or so; that should be enough time for the engine to develop sufficient pressure. Reconnect the power lead, get back in the car, and let the car fast-idle at 1500–2000 rpm for a couple minutes. Get out, do a walk-around of the vehicle, and look under the hood to check for leaks or any other issues.

- Get behind the wheel and give the brake pedal a couple of pumps; do the same with the clutch pedal if your car has one. If the pedals feel soft or spongy, look under the hood to see if there are any leaks. Don't drive the car until these issues are resolved.

- Make your first drive of the season a short one around your neighborhood; that way, if anything happens, you won't be too far from home. Return home and check over the car again, looking for leaks or other issues.

If everything checks out, then you're ready to take some longer trips. Head out on the open road and enjoy the journey!

We hope you enjoyed navigating through the twists and turns of these tips for maintenance and preventive care. We understand that the information provided may not be effective or relevant in every situation. We do not guarantee any outcome with the suggested preventive measures. We encourage you to use good judgment to determine what is appropriate for your specific circumstances.

In Case of Emergency

You've done all the preventive maintenance, checked all the trouble spots, and given your classic a clean bill of health ... and yet here you are on the side of the road. Not to worry: Follow these steps to keep yourself and your classic safe.

- Remain calm as you pull to the right-hand side of the road or off the interstate. Put the vehicle in neutral if you need to cover more distance before stopping. Tire blowouts require you to keep the wheel straight, stay off the throttle, and brake gently to a stop.
- Turn on the four-way hazard lights as you come to a stop; if not equipped, use hand signals to either wave people past or put your arm out (with your palm facing other drivers) to denote you are stopping.
- When parked, engage the emergency brake and leave the hazard lights on, or get your reflective safety triangle and/or flares from your trunk and then place behind your vehicle.
- If you are a Hagerty Drivers Club® member, call **888-310-8020** (866-922-6569 in Canada). If you don't have your card or don't know your membership number, it's not a problem; we can look up your membership information with your name and address. Our support team will take it from there!

Vehicle Info | Your car's vital stats.

vehicle:

year:

make:

model:

engine:

VIN:

date of manufacture: paint code:

vehicle owner:

phone number:

address:

purchase date:

purchased from:

mileage at purchase:

oil type:

brake fluid type:

steering fluid type:

tire make, model:

tire size: wheel size:

mechanic/shop contact:

notes:

So you've got a vintage car...

Owning a vintage car is a great adventure, and it's even more fun keeping it running in top condition. This booklet gives you the information you need to know for basic maintenance, including:

- What to know about modern fuel in older vehicles.
- How to maintain your vehicle's oil.
- Keeping your vehicle's battery in top condition.
- What items to keep in your car when traveling.
- Make sure your tires are ready to roll.
- Ongoing care for your four-wheeled friend.
- Tips for long-term storage of your vehicle.
- What to do in case of an emergency.

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