

KNOWLEDGE IS POWER

A take-charge guide to your vehicle

ACDelco®

TABLE OF CONTENTS

Regular maintenance	1
Recognizing problems	3
Preparing for your appointment	6
Safety on the road	7
Travel tips	11
Emergency road kit	13
Avoiding collisions	14
Defensive driving tips	15
Caring for your vehicle	16



MAINTENANCE GOES A LONG WAY

Staying on top of your vehicle's care is one of the best ways to keep your vehicle running smoothly. From routine oil changes to replacing air filters and everything in between, adhering to a routine maintenance schedule goes a long way. Choosing a quality service provider to care for your vehicle is an important component to help keep you on track. When choosing a service provider, consider these things:

- Technical expertise
- Quality of parts
- Hours and location
- Sense of trust
- Specific service specialty

CHECK YOUR TREADS

- The condition of your tires can affect everything from handling to gas mileage, so check your tires every 3-6 weeks with a tire pressure gauge (your vehicle's recommended tire pressure number can likely be found on a sticker inside the driver's door).
- To help equalize wear, tires should typically be rotated every 6,000 to 8,000 miles.
- If you notice any of the following, it may be time for a tire or alignment service:
  - Wheel bends or dents
  - Recurring loss of tire pressure
  - Tire bumps in the sidewalls
  - Vibration emanating from the wheels
  - Unusual front-end movement when driving on flat surfaces

TIP: When it's time to check the road wear on your tires, grab a penny! Stick it headfirst into the most severely worn part of the tire. If the tread is so worn it doesn't touch the top of Lincoln's head, it's probably time to replace your tires.



YOUR TRANSMISSION

- Depending on driving conditions and your specific vehicle's needs, your transmission fluid and filter could require a change anywhere between 50,000 and 100,000 miles.
- Transmission maintenance requirements vary, so check your Owner's Manual to review your vehicle's specifications.

TIME FOR A CHANGE

- For most newer makes and models, oil changes are recommended approximately every 6,000–7,500 miles.
- If you drive in a dusty region, change your oil and filter every 3,000–5,000 miles.
- Your vehicle may come equipped with built-in technology to alert you when an oil change is necessary.

TIP: Following your vehicle's maintenance schedule for regular maintenance is your best defense against avoidable repairs.





SENSING A PROBLEM IS SIMPLE

YOUR NOSE ALWAYS KNOWS.

POSSIBLE PROBLEM	DESCRIPTION
Antifreeze or coolant leak	Sweet odor, usually accompanied by steam from under the hood.
Burning oil	Thick, heavy odor, sometimes accompanied by smoke from under the hood or exhaust.
Electrical short	Pungent odor, like burned toast.
Emission failure	Continuous, heavy sulfur odor, like rotten eggs.
Overheated brakes or clutch	Burning rubber odor.
Overheating	Hot, metallic odor, usually accompanied by antifreeze/coolant odor.

THINGS TAKE A WRONG TURN?

CAR TROUBLE SYMPTOM	DESCRIPTION
Cuts out	Temporary, complete loss of power. Engine quits at irregular intervals. May occur repeatedly or intermittently, usually under heavy acceleration.
Detonation	Mild to severe pings, usually worse under acceleration. Sounds like popcorn popping.
Dieseling	Engine runs after ignition switch is turned off. Runs unevenly and may make knocking noises.
Hesitation	Momentary lack of response as accelerator is pressed. Can occur at any speed, usually most severe when starting from complete stop. May cause engine to stall.
Miss	Pulsation or jerking that changes with engine speed. Exhaust has a steady spitting sound at idle or low speed. Not normally felt above 30 mph.
Rough idle	Engine runs unevenly at idle. Car may also shake.
Sluggish	Engine delivers limited power under load or at high speed. Doesn't accelerate as fast as normal. Loses speed going uphill. Vehicle has less speed than normal.
Spongy	Little or no increase in speed when accelerator is pressed. Continuing to push pedal down will eventually increase speed.
Stall	Engine stops running or dies. May occur at idle or while driving.
Surge	Vehicle speeds up and slows down with no change to accelerator pedal. Can occur at any speed.



I SPY A PROBLEM!

POSSIBLE PROBLEM	DESCRIPTION
Axle leak	Black stains with heavy, thick consistency.
Coolant leak	Yellow, green, pink or orange stains that are lighter and thinner than oil.
Crankcase, oil, power steering fluid leak	Brownish stains.
Transmission oil leak	Reddish stains.

GET A HANDLE ON HANDLING ISSUES.

CAR TROUBLE SYMPTOM	DESCRIPTION
Bottoming out	Suspension moves to extreme end of travel and hits compression bumpers. Feels like a thud.
Brake fade	Stopping distance seems to increase, causing longer braking distance, similar to braking at high speeds.
Excessive play	Steering wheel must be turned unusually far before vehicle responds.
Hard steering	Vehicle is difficult to steer, especially during parking situations or when first started.
Low brake pedal	Brake pedal must be pushed unusually far to engage brakes.
Brake pedal pulsation	Brake pedal fluctuates while brakes are applied.
Pulls	Vehicle veers to one side when steering wheel is released.
Grabs	Vehicle has a tendency to move right or left when brakes are applied. Brakes engage suddenly when driver applies steady pressure to brake pedal.
Shimmy	Rapid side-to-side motion of both front wheels felt in the steering wheel.
Sway/pitching	Mushy or spongy ride; vehicle takes a long time to recover from bumps in the road.
Vibration	Vehicle shakes.
Wandering	Vehicle meanders, requiring frequent steering adjustments to maintain direction.



WARNING LIGHTS GUIDE THE WAY

A little light can go a long way, especially when it's telling you important information about your vehicle. If any light turns orange or red, it means you should have your vehicle serviced as soon as possible. Use the guide below for more tips.

- **Temperature Gauge/Light** Indicates the temperature of your vehicle's coolant. A reading in the "H" zone of any light means "HOT" and is an indication of trouble. Should you receive this notice, pull over to a safe location, shift into neutral (N) and allow the engine to idle. Do not continue to drive if the temperature does not return to normal or the "HOT" light stays on.
- **Service Engine Soon (SES) Light** This may also be called the Malfunction Indicator Light and is part of the Onboard Diagnostic System, which maintains the Emissions and Engine Control System. Normal operations may show this light briefly when the ignition is turned on. If the light remains on during driving, there may be a potential engine problem. If that's the case, be sure to seek service promptly.
- **Voltage Gauge/Battery Light** This light indicates the electrical system's voltage when the engine is running. Service is required if the battery light comes on or if the pointer moves to either "HIGH" or "LOW," indicating too much or not enough voltage.
- **Oil Gauge/Light** Indicates oil pressure, not the amount of oil in the engine. A continuous "HIGH" or "LOW" gauge reading indicates an engine lubrication issue and the need for immediate service. If the oil light stays on after you start the engine or comes on while you're driving, you could be low on oil or have another problem, so be sure to have your vehicle serviced immediately.
- **OnStar Vehicle Diagnostics*** Every month, OnStar-equipped vehicles can run a thorough check of the engine, transmission, anti-lock brakes and other key systems, and email you the results. If you want an On-Demand Diagnostics check, just push the blue OnStar button and our specially trained Advisors can run a check — even while you're driving.





PUT THE BRAKES ON MYSTERY NOISES

When it comes to your brakes, some noises are normal, while others indicate there could be a problem requiring service. Here are some common noises and possible solutions:

- **Grinding** Grinding is caused by rust buildup on the rotors and is of little concern. The buildup can usually be removed, or sometimes it disappears after a few stops. However, if grinding persists, the problem could be more serious and should be brought to the attention of your service consultant.
- **Loud squeals** Disc brakes with wear indicators may produce a squeal, indicating it's time to change the pads.
- **Trace squeaks or squeals** Semi-metallic brake linings can emit sound. Rain, humidity or cold brakes could be the source. If the problem persists, have the brakes checked.
- **Clicking** Sometimes accompanied by a slight pulsing in the brake pedal at low speeds, it's most likely the Anti-lock Braking System performing a harmless self-check.

PREPARING FOR YOUR SERVICE APPOINTMENT

- Write down your vehicle's symptoms. What noises do you hear? Does the problem occur when the engine is warm or cold? Be sure to describe the symptoms and don't try to diagnose the problem.
- You can expect to receive a thorough explanation of the procedure to be performed on your vehicle before it happens. Ask for a copy of the signed estimate so there are no surprises when it's time to pick up your vehicle.
- If you have any tests conducted during the service, ask for a copy of the results. Save these documents in your glove compartment or in a special place at home for easy reference.
- Ask about obtaining a service contract to cover your vehicle in the event of mechanical failure beyond the manufacturer's warranty.



SAFETY AROUND EVERY TURN

Nothing is more important than your safety and security on the road. Vehicle safety and security features have been created to keep you and your family protected on the road. Be sure to read your Owner's Manual to learn which features are included on your vehicle and how to properly operate them.

SAFETY BELT TIPS

- Lap belt should be worn low and snug on the hips, just touching the thighs.
- Shoulder belt portion should be worn across the chest and over the shoulder.
- According to the National Highway Traffic Safety Administration, safety belt use reduces occupant fatality rates by 50 percent.

TIPS FOR SMALL-STATURE ADULTS

If you have trouble reaching the pedals of your vehicle and tend to sit very close to the steering wheel, you could be hit by the air bag when it inflates with enough force to experience serious injury. To help prevent an injury from occurring:

- Always wear your safety belt.
- Sit as far back as possible while maintaining control of your vehicle.
- Adjustable foot pedals are available in some vehicles and can help small-stature adults sit farther from the air bag.



ONSTAR* EMERGENCY SERVICES

- **Automatic Crash Response** In a crash, built-in sensors can automatically alert a specially trained OnStar Advisor and predict the severity of injuries. An Advisor is immediately connected into your vehicle to see if you need help, even if you can't ask for it.
- **Emergency Services** One push of the red emergency button gives you a priority connection to a specially trained OnStar Advisor who can direct emergency services to your exact GPS location and offer critical assistance until help arrives.
- **Crisis Assist** In severe weather conditions or a crisis, our Advisors can provide a fast, knowledgeable resource if you need emergency assistance, escape routes and other resources. They can also contact family members for you.

AIR BAG SAFETY TIPS

- Remember that air bags work in conjunction with safety belts, not as a replacement.
- Do not sit unnecessarily close to an air bag. When deployed during a crash, air bags inflate at a high speed that can seriously injure or even kill anyone sitting up against it.
- Occupants should not lean on—or sleep against—the door or side windows in vehicles that have seat-mounted or roof-rail air bags.
- In certain vehicles, head curtain air bags are designed to deploy in the event of a rollover to help protect occupants.
- See your Owner's Manual for information about the location and operation of the air bags in your vehicle.





KEEPING LITTLE ONES SAFE AND SECURE

You take great care to keep your children protected, and their safety on the road is a top priority. Here are a few important tips to help ensure a safer ride for your precious cargo:

- Secure all children under the age of 13 in a rear seat.
- Booster seats should be used if a child has outgrown his/her forward-facing child restraint, and until they are about 4'9" tall and weigh between 80 pounds and 100 pounds.
- Infants and young children need the protection of a properly installed child restraint or booster seat.
- Never put a rear-facing child restraint seat in the front vehicle seat, even if the passenger air bag is off. It can cause serious injury or death in the event of an accident.
- It's best to install a forward-facing child restraint in rear vehicle seats. If this isn't possible for your vehicle, then carefully read your Owner's Manual to understand how to properly install a forward-facing restraint in the front vehicle seat.
- The Lower Anchors and Top tethers for CHildren (LATCH) System helps simplify the installation of a child restraint and is compatible with both forward- and rear-facing child restraints.
- Only use a backless booster seat if your vehicle's seatback or head restraint is higher than your child's ear. Otherwise, use a high-back booster seat. Check your state law mandates on booster seats for complete details of usage.



TEEN DRIVER SAFETY

The teen years are a risky time for young drivers. In fact, these crucial years present the greatest risk to new drivers. While driver's training classes teach the important fundamentals, there are further steps your teen can take to decrease his/her risk. The Graduated Driver License system*, for example, has many tips designed to keep teens safe. Some of the key elements of this system include:

- Require a minimum of 50 hours of driving experience over the course of 9 to 12 months, under the direct supervision of a licensed driver—either a parent or other mature adult.
- Set nighttime limitations and passenger restrictions, reducing nighttime restrictions over time.
- Work as a family to develop a vehicle expectation plan with clear direction and consequences. For example, are friends allowed in the vehicle with your teen? Decide these key things ahead of time as a family.
- Require safety belt use for everyone in the vehicle, every time, no excuses. And, of course, obey all other laws.
- GM supports a ban on texting while driving for all drivers. GM encourages all drivers to pair their cell phones with their vehicles and use the integrated audio system. Avoid any tasks that cause a distraction to driving.
- Remember that parents are role models, guides and partners during the teen driving experience.
- While many states include some elements of the Graduated Driver License system, families may want to incorporate additional fundamentals that are not part of their state's new-driver laws.



TRAVEL TIPS THE WHOLE YEAR THROUGH

- Always keep at least half a tank of gas in your vehicle.
- Check all fluids, including oil, antifreeze, transmission, brake and power-steering fluids and windshield solvent.
- Make sure your wipers work and that the blades get replaced periodically.
- Frequently check tires for pressure and air. Not only are properly inflated tires safer, they give you better fuel mileage and longer tire life. Make sure your spare tire is properly inflated and ready in case you need it.
- Make an appointment for an inspection. Clean air filters and new spark plugs mean better gas mileage.
- Have your tires rotated. While you're at it, have the wheel alignment checked. Potholes can affect wheel alignment. This not only causes handling problems, but tires wear out faster.
- Let someone know where you're going, what time you're leaving and when they can expect you—especially when you're driving though isolated areas. Take a map and cell phone with you.

IF YOU BECOME STRANDED:

- Call for roadside assistance.
- Stay in your vehicle. That's where you're safest. Motorists can be injured if they exit their vehicles on busy roads. Emergency crews can find your vehicle a lot easier than they can find you alone. If the temperature is below freezing, you can avoid frostbite and hypothermia by staying in the vehicle and out of the snow and wind.
- Tie a brightly colored cloth to the exterior of the vehicle.
- Keep the doors locked. If strangers approach, roll the window down just enough to ask them to get help.





TIPS FOR WHEN THINGS HEAT UP

- Never leave children alone inside a vehicle.
  - On a typical sunny day, the temperature inside a vehicle can reach potentially deadly levels within minutes—even with a window open.
  - Heat is much more dangerous to children. When left in a hot vehicle, children's core body temperature can rise three to five times faster than that of an adult. This may cause permanent injury or even death.
  - To remind yourself that you have a child with you in the vehicle, place the diaper bag or other child-associated item in the front-passenger seat.
- The hot days of summer strain your vehicle's cooling system. A failure could leave you stranded with an overheated engine. To avoid a potential problem, check the cooling system and look for leaks, worn or bulging hoses and malfunctioning fan operation.

TIP: Caught in a traffic jam? Leave plenty of room between you and the vehicle ahead of you so the radiator can do its job. If the engine overheats, turn off the air conditioner and turn on the heater. You may be a bit uncomfortable, but the heater acts as a second radiator and can help cool the engine.

TIPS FOR WHEN THINGS COOL DOWN

- When snow, ice or water are present, increase the distance between you and the vehicle ahead of you. Allowing more stopping distance gives you more time to react should you hit a patch of ice or slip on the water or snow.
- In extreme cold, always use properly mixed antifreeze. Never use water in your radiator.
- Avoid exposure to the cold and overexertion when attempting to push the vehicle or shovel heavy snowdrifts.



EMERGENCY ROAD-KIT ESSENTIALS

Consider carrying the following items in your vehicle at all times:

- Jumper cables
- Flares or reflective devices
- First aid kit
- Tire pressure gauge
- Blanket
- Bottled drinking water
- Change of clothes
- Automobile registration
- Cell phone
- Copy of your health insurance card
- Marker and message pad
- Emergency contacts
- Flashlight with extra batteries
- Copy of your motor-club membership card
- Shovel
- Window scraper/brush
- Window washer fluid
- Sand or rock salt
- Thermal packs
- Energy bars
- Hat and gloves
- Paper towels
- Road maps



VEHICLE SAFETY FEATURES TO HELP YOU STAY IN CONTROL

ELECTRONIC STABILITY CONTROL (ESC)

- ESC helps maintain control of your vehicle while steering.
- ESC systems use selective braking to help you control the vehicle's direction and keep it on course.

DAYTIME RUNNING LAMPS (DRLs)

- Located on the front exterior of your vehicle, these lamps help increase vehicle visibility for other drivers and pedestrians during fog, rain, dusk and bright sunshine.
- Using headlamps during daylight hours reduces crashes between 2.3 percent and 12.5 percent, depending on the driving conditions and type of collision.
- DRLs reduce daylight collisions with pedestrians by nearly 15 percent, and by 45 percent with children younger than 12.

ANTI-LOCK BRAKE SYSTEMS (ABS)

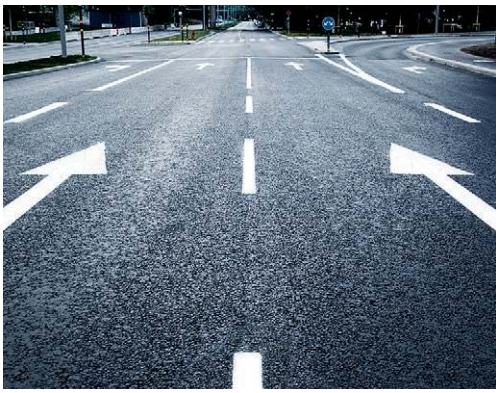
- ABS helps you maintain steering control during hard braking, especially on slippery surfaces.
- During a panic stop with ABS, hold the brake pedal down firmly—do not pump it.

TRACTION CONTROL (TC)

- Provides controlled accelerations while allowing limited wheel slip when road conditions are slippery.

TIP: Before entering your vehicle, utilize the SPOT THE TOT℠ technique—take a quick walk around the perimeter of your vehicle to check for children, pets or toys. Once inside, avoid distracting behaviors while driving, including talking on the phone and/or texting, eating and interacting with children. And keep your hands on the wheel and your eyes on the road at all times.





DEFENSIVE DRIVING FOR YOUR PROTECTION

From the Bondurant School of High-Performance Driving:

- **Adjust your seat properly.** Sitting upright enables your body to feel and sense what the vehicle is telling you.
- **Scan the entire environment** during normal driving conditions.
- **Be smooth with your steering,** acceleration and braking to keep the vehicle balanced.
- **Watch driving on curves.** Drive at a reasonable speed, which may mean you need to drive slower than the posted speed limit. Driving at a high speed around curves could cause you to lose control.
- **Trail the brakes.** This means to ease off the brake pedal slowly as you turn into a corner. It keeps the weight on your front-steering tires, creating more traction for the turn.
- **Elevate your vision.** Things come at you fast when you look only at the vehicle in front of you. Look 10 to 15 vehicles ahead and you'll find that everything comes at you more predictably.
- **Turn your wheels with the skid.** Taking this action may help you to regain control of your vehicle. If you have a skid situation, ease off the throttle to transfer weight back onto the front-steering tires.



SIMPLE WAYS TO CARE FOR YOUR VEHICLE

- **Eliminate roll shifting.** Always come to a complete stop before shifting from Drive into Reverse or vice versa.
- **Use your parking brake on hills.** When you set the parking brake and the ignition is on, the brake system warning light will come on. To prevent any damage to your brake system, make sure the parking brake is fully released and the warning light is off before driving.
- **Don't ride the clutch.** If your vehicle is equipped with a manual transmission, improperly releasing the clutch pedal, pushing it too far or not far enough or riding it at the point of engagement can damage parts. Strive for smooth, seamless shifting.
- **Fill your tank.** Allowing your gas tank to run dry or be consistently low can lead to problems. Fuel pumped from a relatively dry tank may carry oxygen, moisture and deposits into the fuel line, and this could damage the fuel filter or fuel pump. It's best to fill your tank any time it's less than one-third full.
- **Beware of additives.** Mixing additives into oil, transmission fluid or gasoline may upset the chemical balances that already exist in these fluids. Stay away from additional additives unless recommended by your service consultant.
- **Choose soap designed for clearcoat paint finishes.** The presence of abrasives could weaken the clearcoat and dull the finish. Dishwashing detergent can be hazardous to your vehicle's finish. Soaps made for today's clearcoat finishes are available at auto parts stores, grocery stores or drug store chains.
- **Follow your vehicle's maintenance schedule.** It's best to change your oil, filters and spark plugs and to conduct other maintenance as outlined in your Owner's Manual.