

A Take-Charge Guide to Your Vehicle

# KNOWLEDGE IS POWER





You can count on  
ACDelco parts to help keep your  
vehicle running smoothly.

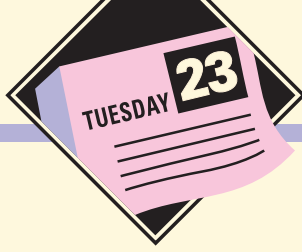
ACDelco is a global leader in the  
automotive aftermarket, offering  
quality replacement parts for  
most vehicles on the road today.  
For over 100 years, ACDelco has  
been supplying parts, technical training  
and business expertise to  
Independent Service Centers.

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## Stay on the Go With Regular Maintenance

Keeping your vehicle in top shape means finding a great service provider first. When looking for one, consider these things:

- Technical expertise
- Quality of parts
- Hours and location
- Someone you feel you can trust
- Do you need a specific type of service done or overall maintenance

### Check your treads

- The condition of your tires can affect everything from handling to gas mileage
- Keep a tire pressure gauge in your car and check all your tires frequently
- Recommended tire pressure can usually be found on a decal or sticker inside the driver's door
- Tires should typically be rotated every 6,000 to 8,000 miles to equalize tire wear
- Indicators that you need tire or alignment service:
  - Bends or dents in the wheels
  - Recurring loss of tire pressure
  - Bumps in the sidewalls of your tires
  - Vibration emanating from the wheels
  - Unusual front-end movement on flat surfaces

**TIP:** To check road wear on your tires, use a penny. Just insert the coin—head first—into the most severely worn part of the tire. If the tread is not sufficient to touch the top of Lincoln's head, it's probably time to replace your tires.



### **Your transmission**

- Scheduled transmission maintenance services vary, so check your Owner's Manual to see yours
- Depending on your vehicle and driving conditions, the transmission fluid and filter could require a change anywhere between 50,000 and 100,000 miles

### **Time for change**

- For most newer makes and models, oil changes are recommended approximately every 6,000-7,500 miles
- However, if you drive in a dusty area, be sure to change your oil and filter every 3,000-5,000 miles
- Many vehicles are also equipped with computers that alert drivers when to change their oil

**TIP:** Following your vehicle's schedule for regular maintenance is your best defense against spending extra time in the shop for unscheduled service or repairs. If you'd like some help in keeping track of your vehicle maintenance and service, visit [acdelco.com](http://acdelco.com) and sign up for the free maintenance reminder service.



## How to Recognize Problems Using Your Senses

To better describe symptoms to your service advisor, use the information below. You'll also want to look, listen and feel for dashboard warning lights, fluid leaks, smells, abnormal sounds, vibrations, shimmying, etc. and note where they're coming from.

### What's That Smell?

Possible Problem	Smell
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 the 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

### It's Not Running Right. Car Trouble Symptom

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.

**See This?**

**Possible Problem**

- Axle leak
- Coolant leak
- Crankcase, oil, power steering fluid leak
- Transmission oil leak

**Handling Issues.**

**Car Trouble Symptom**

Bottoming out

Brake fade

Excessive play

Hard steering

Low brake pedal

Brake pedal pulsation

Pulls

Grabs

Shimmy

Sway/pitching

Vibration

Wandering

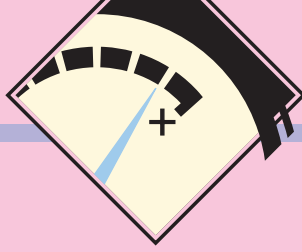
**Stain**

- Black stains with heavy, thick consistency
- Yellow, green, pink or orange stains that are lighter and thinner than oil
- Brownish stains
- Reddish stains

**Description**

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





## Heed Your Warning Lights

Your instrument cluster includes numerous dials, gauges, warning lights and driver information message centers. If any of these lights turn orange, it means you should have service ASAP. If it turns red, you should stop driving your vehicle, and service is required ASAP.

**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. Pull over, 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. However, if the light remains on during driving, there may be a potential engine problem; seek service promptly.

**Voltage Gauge/Battery Light** Indicates the Electrical System's voltage when the engine is running. Service is required if the pointer moves to either "HIGH" or "LOW," indicating too much or not enough voltage, or if the battery light comes on.

**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 malfunction and the need for immediate service. If you have a problem with your oil, the oil light may stay on after you start your engine or come on when you're driving. This light shows that oil is not going through your engine quickly enough to keep it lubricated. The engine could be low on oil or have another problem. Have your vehicle serviced immediately.

**OnStar Vehicle Diagnostics Check\*** If your vehicle has OnStar, some of your vehicle's key systems, including your engine, air bags, anti-lock brakes and more, can be checked while you drive. A monthly e-mail report is then sent to you, including maintenance alerts, your remaining oil life and current mileage. Go to [onstar.com](http://onstar.com) for more information.

\*Available on 2004 MY and newer GM models equipped with the GM Engine Oil Life System. Diagnostics not available on Cadillac Catera, Pontiac Vibe, Saab 9-3 and 9-5. Diagnostic services vary on Cadillac SRX V-8, Saturn VUE, Ion and L-Series, Chevrolet Silverado diesel and GMC Sierra diesel. For details, call 1.888.4ONSTAR (1.888.466.7827).





## What Do Brake Noises Tell You?

Some brake noises are normal, while others indicate problems requiring service. This is what the noises could mean:

- **Grinding** When caused by rust building up on the rotors, it's of little concern. The buildup can usually be removed, or sometimes it disappears after a few stops. If grinding persists, the problem could be more serious and should be addressed immediately.
- **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.

## Talking To Your Technician

- Write down the symptoms. For example, note if the condition is weather related or occurs when the engine is warm or cold.
- Describe the symptoms, don't try to diagnose the problem.
- Check to see what service hours best work with your schedule.
- Understand the service to be performed. You should expect to receive a thorough explanation of the maintenance or repairs to be performed on your vehicle. Also, be sure to get a copy of a signed estimate for parts and labor, so there are no surprises at vehicle pickup time.
- Rates may vary. There are flat rates for some repairs and hourly rates for others. When in doubt, ask your service consultant.
- Ask about a service contract. This is a protection plan that covers your vehicle in the event of mechanical failure beyond the manufacturer's warranty.
- If you have any tests conducted during service, ask your service advisor for those test results.



## Safety on the Road

Vehicle safety and security features help keep you protected. Be sure to read your Owner's Manual to learn what safety features your vehicle has and how to properly operate them. Here are some tips and facts of the most common features:

### Safety belts

- 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 45 to 60 percent.**

### WARNINGS: 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\*

- Vehicles equipped with OnStar have an Automatic Crash Notification System, which can automatically alert the OnStar Call Center when an air bag deploys during a collision.
- If emergency assistance is needed, OnStar will contact an emergency service provider.
- Great for women who often travel alone or with children.
- If your vehicle is OnStar-equipped and you have children, teach them how to respond to OnStar after a crash.

\*OnStar services require vehicle electrical system (including battery), wireless service and GPS satellite signals to be available and operating to function properly. OnStar acts as a link to existing emergency service providers. Subscription service agreement required. Visit [onstar.com](http://onstar.com) for details and system limitations.



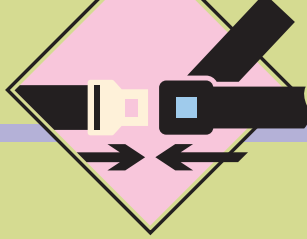
### **Air bags**

- 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 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.
- Side-impact air bags and head curtain air bags are designed to deploy in the event of a rollover and help to protect the head and chest.
- See your Owner’s Manual for information about the location and operation of the air bags in your vehicle.

### **Air bag On/Off switches**

Use of the “On/Off” switch should only be considered when:

- Vehicle has no rear seat (pickups or sports cars)
- The vehicle is too small to accommodate a child restraint in the rear seat
- The child has a medical condition which, according to the child’s physician, makes it necessary for the child to ride in the front seat
- A medical condition places an adult at greater risk if the air bag deploys than from turning off the air bag



## **WARNINGS: For Children**

For a safer ride for your precious cargo, here are a few tips:

- Secure all children under the age of 13 in a rear seat.
- 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 as it can cause serious injury or death in the event of an accident and the deployment of the air bag.
- It is best to install a forward-facing child restraint seat in rear vehicle seats. If this isn't possible for your vehicle, then carefully read your Owner's Manual to understand how to best install a forward-facing restraint in the front vehicle seat.

For safety and security tips, as well as other helpful information, visit [ourpreciouscargo.com](http://ourpreciouscargo.com), or contact your local SAFE KIDS Coalition at [usa.safekids.org](http://usa.safekids.org).

### **Lower Anchors and Top tethers for CHILDREN (LATCH) System**

- LATCH System helps simplify the installation of child restraint seats.
- Compatible with both forward- and rear-facing child seats.

### **Booster seats**

- Should be used if a child weighs between 80 and 100 pounds and is less than 4'10" in height.
- Only use a backless booster seat if your car's seatback is higher than your child's ear and has a head restraint. Otherwise, use a high-back booster seat.
- You should also check your state law mandates on booster seats for complete details of usage.



## Teen Driver Safety

The teen years are the greatest time of risk for drivers during their lifetime. Young drivers are inexperienced and, as a result, often cannot accurately judge traffic safety risks or take appropriate actions to reduce accidents.

To do your part, apply the fundamentals of the Graduated Driver License\* system to help reduce teen driver risks. Some of the key elements include:

- Work as a family to develop a plan with clear expectations and consequences.
- Require safety belt use for everyone, every time, no excuses. And obey all other laws.
- Require a minimum of 50 hours of driving experience over the course of 9 to 12 months, under the direct observation and supervision of a licensed driver—either a parent or other mature adult.
- Set nighttime limitations and passenger restrictions. Reduce nighttime restrictions over time and with experience. Allow no accompanying passengers under a specific age that is determined by parents.
- Accept no distracted driving or other unsafe or illegal behaviors. This includes texting or talking on the phone while driving.
- Parents need to remember that they 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.

\*The National Safety Council joined scientists and traffic safety experts, with GM's support, to create "Teen Driver — A Family Guide to Teen Driver Safety" that explains the fundamentals of Graduated Driver License systems. For a downloadable copy, go to [gm.com/experience/education/9-12/drivers\\_education/teen\\_driving/0\\_intro.pdf](http://gm.com/experience/education/9-12/drivers_education/teen_driving/0_intro.pdf).



## Travel Tips

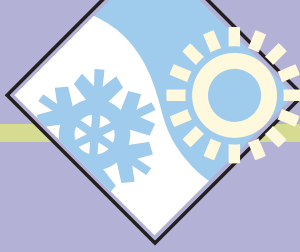
### Summer

- 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.
- Check the cooling system. Look for leaks, worn or bulging hoses and malfunctioning fan operation. The hot days of summer strain the cooling system, and a failure can leave you stranded with an overheated engine.

**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 uncomfortable, but the heater acts like a second radiator and can help cool the engine.

### Winter

- Drive more conservatively. When snow, ice or water are present, increase the distance between you and the vehicle ahead of you. Allow more stopping distance than you might leave for clean, dry pavement.
- In extreme cold, always use properly mixed antifreeze. Do not use water in your radiator.
- Avoid exposure to the cold and overexertion when attempting to push the vehicle or shovel heavy snowdrifts.

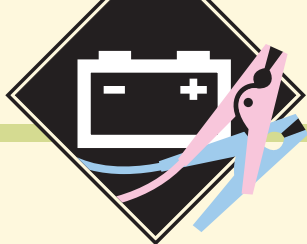


## Year-Round Travel Tips

- Always keep at least half a tank of gas in your vehicle.
- Check all fluids, including oil, antifreeze, transmission, brake, power steering 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.
- Rotate tires. 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 when you're driving through 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 the 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.

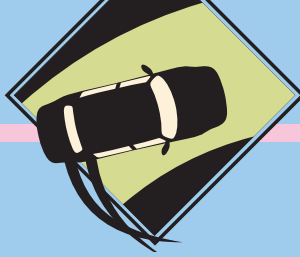


## Emergency Road Kit Essentials

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
- Proof of insurance
- 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
- Disposable camera
- Road maps





## **Avoiding Collisions Begins With Awareness**

### **SPOT THE TOT®**

- Walk all the way around your parked vehicle to check for children, pets or toys before entering, starting or moving your vehicle

### **Electronic Stability Control (ESC)**

- Helps you 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 to 12.5 percent, depending on the driving conditions and type of collision
- Reduce daylight collisions with pedestrians by nearly 15 percent, and 45 percent with children under 12

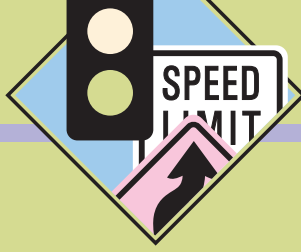
### **Anti-lock Brake Systems (ABS)**

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

### **Traction Control (TC)**

- Helps provide controlled accelerations while allowing limited wheel slip when road conditions are slippery

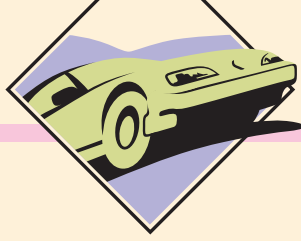
**TIP:** Avoid distracting behaviors while driving. This includes behaviors such as talking and/or texting on the phone, eating, reading a map, changing a CD and disciplining children. Keep your hands on the wheel and your eyes on the road at all times.



## 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.
- **Enjoy driving your vehicle.** Don't overstep your limits of the road conditions.



## Simple Ways to Take Better Care of Your Vehicle

- **Start your vehicle and get moving.** The faster you get the engine up to its proper operating temperature, the better.
- **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.



## Helpful Web Sites

### **womencertified.com**

A Web site that helps you search and find quality and trustworthy businesses in your area.



### **carcare.org/womens\_board**

For additional car care information.

### **epa.gov**

To find out more information on how to lessen your impact on the environment and tips for a cleaner drive.

### **nhtsa.gov**

National Highway Traffic Safety Administration Web site has a load of information and tips on safe driving, including some of the most up-to-date stories on the changes in the automobile industry and how it can affect you.

### **acdelco.com**

To find tips on maintaining your vehicle, hitting the road, maintenance reminders and more.









***Be Car Care Aware®***



***ACDelco***<sup>®</sup>

