



# LifeSmarts

*Learn it. Live it.*

## Key Points

### SAFETY FIRST

Regular maintenance of key systems like brakes, tires, and lights ensures your vehicle operates safely and reduces the risk of accidents.

### ROUTINE MAINTENANCE SAVES MONEY

Performing regular oil changes, tire rotations, and battery checks can extend the lifespan of your car and prevent costly repairs in the future.

### UNDERSTAND COSTS

Budgeting for fuel, insurance, and unexpected repairs is essential to managing ongoing vehicle expenses and avoiding financial surprises.

## Core Concepts

### UNDERSTAND YOUR DASHBOARD

Your car's dashboard alerts you to important issues, from low fuel to critical engine problems. Learning about dashboard symbols and warning lights ensures that you can address minor issues before you need major repairs.

### FLUID FUNDAMENTALS

Get oil changes every 5,000 miles to keep your engine running smoothly. Check coolant levels when the engine is cool, and never open the radiator cap when hot. Keep windshield washer fluid filled to maintain visibility. Proper fluid maintenance prevents overheating and ensures optimal vehicle performance.

### TIRE SAFETY

Check tire pressure regularly to match the recommended PSI. Use the penny test to check for tread wear—if the top of Lincoln's head is visible, replace the tires. Rotate tires every 5,000 miles to ensure even wear & longer life.

### MANAGING VEHICLE EXPENSES

Beyond fuel and insurance, account for regular maintenance like oil changes and tire rotations to avoid larger repair bills. Unexpected costs such as replacing worn-out tires, brake pads, or batteries can add up. Plan for yearly registration fees and potential loan payments to manage long-term car ownership expenses.



# Automotive Basics

## Vocabulary

- |                       |                  |
|-----------------------|------------------|
| 1. Oil Change         | 11. Maintenance  |
| 2. Tire Rotation      | 12. Battery      |
| 3. Brake Pads         | 13. Coolant      |
| 4. Transmission Fluid | 14. Air Filter   |
| 5. Fuel Efficiency    | 15. Cabin Filter |
| 6. Insurance Premium  | 16. Alignment    |
| 7. Registration Fees  | 17. Jump-Start   |
| 8. Loan Principal     | 18. Overheating  |
| 9. Repair Costs       | 19. Flat Tire    |
| 10. Accident Claims   | 20. Depreciation |

## Acronyms

- |        |                                 |
|--------|---------------------------------|
| 1. MPG | Miles per Gallon                |
| 2. ABS | Anti-lock Braking System        |
| 3. OEM | Original Equipment Manufacturer |
| 4. VIN | Vehicle Identification Number   |
| 5. EV  | Electric Vehicle                |
| 6. RPM | Revolutions per Minute          |
| 7. PSI | Pounds per Square Inch          |
| 8. DOT | Department of Transportation    |

## FACT

**Electric and hybrid vehicles are gaining in popularity. 1.9 million electric vehicles were on the road in 2023. By 2030, that number is expected to be 28.3 million.**



# Teen Driver Car Maintenance and Repair Guide

## Vehicle Maintenance Checklist

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In this section, we highlight a list of vehicle components that should be checked on a routine basis to keep your car running its best, to help you avoid costly repairs and to extend the life of your vehicle. Be sure to always wear safety glasses when necessary, as well as other personal protective equipment such as latex gloves and closed toe shoes.

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- 1. Check the Oil
- 2. Check the tire pressure
- 3. Check the battery
- 4. Check the coolant
- 5. Check the windshield wiper fluid and blades
- 6. Check your lights

## 1. Check the Oil

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For help, [view pictures of how to check engine oil.](#)

Motor oil is designed to lubricate, cool and seal internal engine components. That's why regularly checking and changing engine oil is an important part of overall vehicle maintenance. Running the engine with little or no oil will cause the engine to overheat and eventually seize up. Neglecting to change the oil periodically will shorten the life of your engine.

- Step 1** Start your vehicle and warm up the engine. Park the vehicle on a level surface and turn off the engine. Wait 2 or 3 minutes to allow the oil to drain to the bottom of the oil pan.
- Step 2** Open the hood and locate the engine oil dipstick. Refer to your vehicle owner's manual for the exact location.
- Step 3** Pull the oil dipstick out of the tube and wipe off the engine oil with a clean shop rag.
- Step 4** Reinsert the dipstick into the dipstick tube all the way.
- Step 5** Pull the oil dipstick out and check the oil level. The oil level should be between the Min and Max marks on the dipstick.
- Step 6** Add oil if below the Min mark. It takes one quart to raise the oil level from Min to Max.



## 2. Check the tire pressure

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For help, [view pictures of how to check tire pressure.](#)

Tire pressure is often overlooked, but it directly influences how a vehicle performs on the road. Low tire pressure can affect handling, overall ride and fuel economy. Over-inflating tires can cause the vehicle to ride hard, and the tires to wear prematurely. It's also important to know that temperature directly affects tire pressure. Be sure to check your vehicle's tire pressure on a regular basis. For even more tire care tips, [click here.](#)

- Step 1** Locate the tire's valve stem.
- Step 2** Using a tire pressure gauge, hold the gauge down on the valve stem to get the tire's pressure reading. Perform this step for all of the tires on your vehicle.
- Step 3** Compare the tire pressure to the information on the sticker located on the driver side door jam. Please make sure that the tires are cold and have not been driven on for at least an hour as the tire's air pressure will increase as the temperature of the tire increases.
- Step 4** If needed, inflate the tires to the manufacturer's specifications.



### 3. Check the battery

Click here for a step-by-step guide on [how to replace a battery](#).

Your car's battery stores the electrical energy necessary to start your vehicle's engine and power electrical components while the engine is not running. The battery should be secure to prevent damage, and the cable connections should be clean and tight to allow the proper flow of electricity. Most car batteries are a sealed lead acid type battery that lasts from three to five years depending on driving conditions. If your engine turns over slowly, this is a good indication that your battery is nearing the end of its life. If your car does not start at all, chances are, your battery is already dead. Replacing a battery is not a difficult job on most cars, just remember to wear hand and eye protection.

- Step 1** Using a digital multi-meter, check the battery voltage with the engine off and the battery cool. A digital multi-meter is reasonably priced and easily available at your local auto parts store. The best time to check a battery is in the morning before you drive. A fully charged battery should read about 12.6 volts.
- Step 2** Inspect the battery posts and cables for corrosion. Corrosion is a white powdery or chalky substance that forms on top of the battery.
- Step 3** Check the date code on the battery to determine the age.



### 4. Check the coolant

For help, view pictures of [how to check coolant level](#).

Cooling system failure is the number one cause of mechanical breakdowns on the road. Checking the coolant level, mixture, and condition on a regular basis could prevent you from being stranded. Coolant/antifreeze usually contains ethylene glycol or propylene glycol, and other additives. It raises the boiling point and lowers the freezing point of the cooling system when mixed with distilled water. A 50/50 mixture is recommended for optimum performance. Litmus paper and antifreeze testers are readily available to test the condition and mixture. To check the coolant level, follow the steps below.

- Step 1** Turn off your car and wait until the engine is cool.
- Step 2** Open the hood of your car and locate the coolant reserve tank. It is usually a clear or white plastic tank that is connected to the radiator with a hose. Lines printed on the outside of the container will indicate whether or not the fluid level is high or low.
- Step 3** If the level is low, unscrew the cap of the reserve tank and pour in a 50/50 mixture of Antifreeze/Coolant and distilled water. Use a funnel to avoid spillage.
- Step 4** If the reservoir is empty, you may need to add coolant to the radiator as well. Remove the radiator cap (be sure the engine is cool) and add coolant until you can see the top of the fluid level inside. Be careful not to overflow.



**Step 5** If your car doesn't have a reservoir for Antifreeze/Coolant, pour the fluid directly into your radiator. Again, be careful not to overflow.

**Step 6** When you're finished, reinstall the caps. Remember, most coolants are toxic, so don't leave open containers or leftover coolant lying around for children or pets to ingest, as it can be fatal.

[Click here for tips on how to get your car ready for Summer Driving](#)

[Click here for tips on how to Winterize your vehicle](#)

## 5. Check the windshield wiper fluid and blades

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For help, view pictures of [how to replace windshield wiper blades](#).

Windshield wiper fluid and blades are essential to keeping your windshield clean while driving. It's important to service your wiper fluid and blades regularly since the blades can dry and crack from the sun, or wear down from regular use. Wiper blades that skip, streak or leave spots or smears should be replaced.

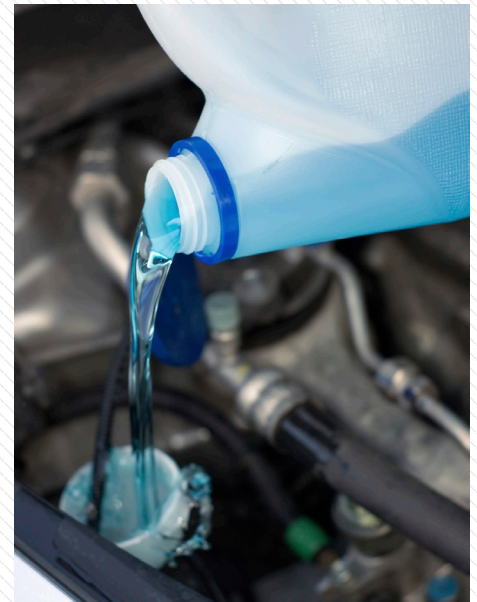
**Step 1** Turn off the engine and open your hood.

**Step 2** Locate the windshield wiper fluid reservoir (typically a clear to white-colored jug filled with blue windshield washer fluid). Be sure not to mistake it for the coolant reservoir which can look similar. The coolant reservoir will be connected by a hose to the radiator.

**Step 3** Open the reservoir.

**Step 4** If the level is low, usually less than three-quarters full or below the "Fill" line on the jug, pour windshield washer fluid to the top of the container.

**Step 5** Examine your windshield wiper blades for damage and wear. When operating, if the blades skip, streak or leave spots or smears, they should be replaced.



## 6. Check your lights

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Your car's headlights, taillights, brake lights and turn signals are essential in not only helping you see clearly while driving, but in helping others see you clearly too. Headlight and taillight bulbs are readily available from your local auto parts stores, and they are (in most cases) easy to change. It's important to make sure all of your vehicle's lights are working properly, especially since you spend most of your time inside your vehicle and might not know when one of your lights is not working.

### Checking Headlight Bulbs

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For help, view pictures of [how to replace a headlight bulb](#).

**Step 1** Turn the key to the on position.



- Step 2** Turn on your headlights and put them in the high beam position using the headlight controls next to your steering wheel.
- Step 3** Exit the vehicle and go to the front of your car to inspect whether your high beam bulbs are working for both headlights.
- Step 4** Re-enter your vehicle and put your headlights in the low beam position using the headlight controls next to your steering wheel.
- Step 5** Re-exit the vehicle and go to the front of your car to inspect whether your high beam bulbs are working for both headlights.

### Checking Brake Light Bulbs

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For help, view pictures of [how to replace a brake light bulb](#).

- Step 1** Have an assistant (friend or family member) step on the brakes while you inspect the lights at the rear of your vehicle.
- Step 2** Locate any burned out brake light bulbs.

### Checking Tail Light Bulbs

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For help, view pictures of [how to replace a taillight bulb](#).

- Step 1** Turn the key in the on position.
- Step 2** Turn the head light switch to on.
- Step 3** Standing outside of the vehicle, inspect the rear tail lights.
- Step 4** Locate any burned out tail light bulbs.
- Step 5** Turn the key and head light switch to the off position.

### Checking Turn Signals

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- Step 1** Turn the key to the on position.
- Step 2** Move the turn signal switch to engage the left turn signal. Inspect the front and rear bulbs.
- Step 3** Move the turn signal switch to engage the right turn signal. Inspect the front and rear bulbs.

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# Teen Driver Car Maintenance and Repair Guide

## Vehicle Maintenance & Repair Instructions

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In this section, we've provided detailed instructions to help you perform basic maintenance tasks and repairs on your vehicle, to keep it running at its best, to avoid costly repair shop bills and to extend the life of your car. Be sure to always wear safety glasses when checking your vehicle, as well as other personal protective equipment such as latex gloves and closed toe shoes.

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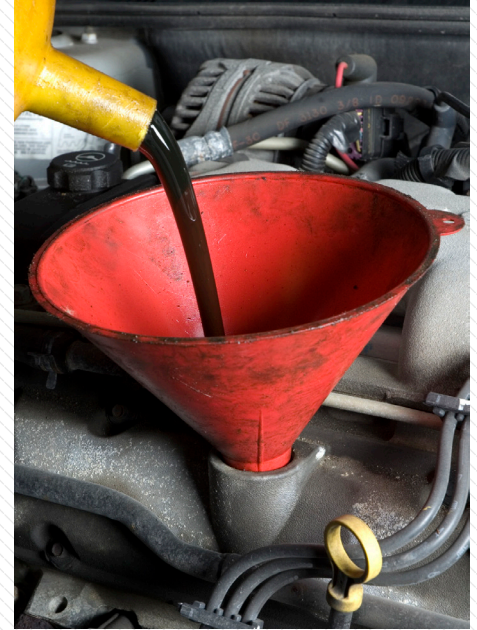
- 1. How to change oil
- 2. How to change a flat tire
- 3. How to jumpstart a battery
- 4. How to replace light bulbs
- 5. How to replace windshield wiper blades
- 6. How to replace an air filter

# 1. How to change oil

For help, view pictures of [how to change engine oil](#).

Motor oil is designed to lubricate, cool and seal internal engine components. When the engine is on, oil is constantly circulating through critical parts of your car's motor. That's why regularly checking and changing engine oil is an important part of overall vehicle maintenance. Neglecting to change the oil periodically will shorten the life of your engine. If your engine oil level is low, check for potential leaks.

- Step 1** Start your vehicle and warm-up the engine. Oil contaminants will drain more easily from a warm engine.
- Step 2** Park your vehicle on a solid level surface, turn off the engine and set the parking brake. Driving the vehicle on ramps or lifting the front of the vehicle may be necessary to change the engine oil if the vehicle ground clearance is too low.
- Step 3** Open the hood and locate the engine oil fill cap.
- Step 4** Remove the engine oil fill cap. This will allow the dirty oil to drain quicker.
- Step 5** Place a drain pan under the oil drain plug located below the engine. Remove the oil drain plug.
- Step 6** Completely drain the dirty oil into the drain pan.
- Step 7** Install the oil drain plug with a new gasket. Tighten the drain plug to the manufacturer's specifications.
- Step 8** Place a drain pan under the oil filter and remove the filter using an oil filter wrench. Make sure the gasket comes off with the filter. Wipe off the mounting surface with a clean towel.
- Step 9** Apply a light film of oil on the new oil filter gasket. Install the new oil filter by hand. Tighten the filter 3/4 to 1 turn after the gasket makes contact.
- Step 10** Add the proper amount and type of engine oil. Refer to your vehicle owner's manual for the engine oil capacity and recommended type.
- Step 11** Check the oil level with the engine oil dipstick. The oil level should be above the full mark. This is normal because the oil has not entered the filter yet.
- Step 12** Install the engine oil fill cap and start the engine.
- Step 13** Turn off the engine and recheck the engine oil level.
- Step 14** Dispose of your used oil properly. Do not dump it on the ground or down a storm sewer drain.



## 2. How to change a flat tire

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For help, view pictures of [how to change a flat tire](#).

A flat tire can occur anywhere and at anytime, so knowing how to change a flat tire is essential part of your vehicle repair and maintenance knowledge.

- Step 1** Park the vehicle on a solid, level surface and set the parking brake. If you are driving when a flat tire occurs, pull off to the side of the road and turn on the hazard lights. Do not attempt to replace a flat tire on the road if it is not safe.
- Step 2** Locate and remove your spare tire, the car jack, and the lug nut wrench or tire iron.
- Step 3** If necessary, remove the wheel hub cap from the flat tire. Break loose the wheel lug nuts by turning them counter-clockwise with a tire iron. Do not remove the lug nuts until the vehicle is raised.
- Step 4** Using your car jack, lift the vehicle where the flat tire is located. Check your vehicle owner's manual for proper jacking locations.
- Step 5** Remove the lug nuts. Remove the flat tire and set it aside.
- Step 6** Install the spare tire on the wheel hub by aligning the lug nut holes with the studs. Install the lug nuts and snug them down with the tire iron in a star pattern.
- Step 7** Lower the vehicle to the ground and remove the jack. Tighten the lug nuts securely in a star pattern.
- Step 8** If applicable, re-install the hub cap. Place the flat tire in the trunk, and return the car jack and the tire iron to their proper locations.

For even more tire care tips, [click here](#).

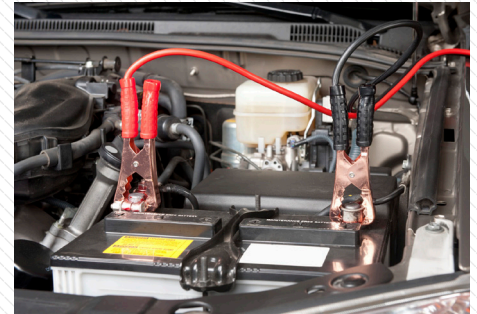


### 3. How to jumpstart a battery

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If your engine won't turn over (crank), chances are, your battery is dead. If you have a set of jumper cables and another vehicle, you can "jumpstart" the battery and drive your car home or take it to a repair shop.

- Step 1** Locate a working vehicle and verify that the working vehicle's battery is the same voltage as yours. Most car batteries are 12 Volts. Have the owner of the working vehicle drive and park the vehicle close to the hood of your car.
- Step 2** Unwind the jumper cables and then attach the red clamp FIRST to the (+) positive post on the dead battery. Then connect the other end with the red clamp to the (+) positive post on the good battery.
- Step 3** Now connect a black clamp to the (-) negative post of the good battery. Then connect the remaining black clamp (for the dead battery) to a piece of grounded metal on the dead car, preferably one that is dirt-free and paint-free.
- Step 4** Turn on the working vehicle and let it idle for a few minutes. Do not race the engine of the working car by stepping on the accelerator. Start the car with the dead battery. If it doesn't start, wait five minutes and try again.
- Step 5** If your vehicle doesn't start after the second charge, chances are your battery needs to be replaced. If your vehicle starts, remove the battery cables in the REVERSE order of the way you attached them.
- Step 6** Keep your vehicle's engine running for about 20 minutes to charge the battery before driving.



## 4. How to replace light bulbs

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Your car's headlights, brake lights and taillights are essential in not only helping you see clearly while driving, but in helping others see you clearly too. Your headlight bulbs need to be in good working order, especially for night time driving, and your brake light and taillight bulbs should also be in good working order to alert other drivers that you are braking or changing lanes. It's important to make sure all of your vehicle's lights are working properly to keep you, and others, safe while driving.

### Replacing a Headlight Bulb

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For help, view pictures of [how to replace a headlight bulb](#).

- Step 1** Open the hood and locate the back of the headlight assembly near the front of the engine compartment.
- Step 2** Twist and remove the socket assembly from the back of the headlight.
- Step 3** Disconnect the headlight bulb from the socket assembly. Check the connection for dirt and corrosion. Clean as necessary with electrical spray cleaner. Install the new headlight bulb into the socket, and re-install the socket assembly to the headlight.
- Step 4** Turn on the headlights and check high and low beams to verify the light is working.

### Replacing a Brake Light Bulb

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For help, view pictures of [how to replace a brake light bulb](#).

- Step 1** Open the trunk and remove the rear cover to expose the back of the taillight assembly.
- Step 2** Twist and remove the socket assembly for the brake light bulb.
- Step 3** Disconnect the brake light bulb from the socket assembly.
- Step 4** Install the new brake light bulb.
- Step 5** Reconnect the socket to the back of the taillight assembly.
- Step 6** Depress the brake pedal and have an assistant verify the light is working.



## Replacing a Taillight Bulb

For help, view pictures of [how to replace a taillight bulb](#).

- Step 1** Turn the key to the on position.
- Step 2** Turn the head light switch to on.
- Step 3** Standing outside of the vehicle, inspect the rear tail lights.
- Step 4** Locate the burned out tail light bulb.
- Step 5** Turn the key and head light switch to the off position.
- Step 6** Gain access to tail light bulb. Open the trunk and remove the rear cover to expose the back of the taillight assembly.
- Step 7** Remove the wiring harness from the tail light lens assembly.
- Step 8** Disconnect the tail light bulb from the wiring harness socket.
- Step 9** Install the new tail light bulb.
- Step 10** Reconnect the wiring harness to the tail light lens assembly.
- Step 11** To confirm proper installation of the new tail light bulb, place the key in the on position. Then turn on the head light switch to verify the tail light bulb is working.

## 5. How to replace windshield wiper blades

For help, view pictures of [how to replace a windshield wiper blade](#) or pictures of [how to replace windshield wiper blade refills](#).

Good wiper blades help you see clearly while driving because they clean dirt, debris, rain and other obstacles from the surface of your windshield. It's important to change your wiper blades once a year since they can dry and crack from the sun or heat, or wear down from regular use. Wiper blades that skip, streak or leave spots or smears should be replaced.

- Step 1** Locate the windshield wipers.
- Step 2** Remove the wiper blade assembly from the wiper arm.
- Step 3** Using pliers, pinch the metal tabs on the rubber insert and slide the insert out of the wiper blade assembly.
- Step 4** Slide the new rubber insert into the wiper assembly until the metal tabs are locked and prevent the insert from sliding.
- Step 5** Reinstall the wiper assembly to the wiper arm.
- Step 6** Test the wipers for proper operation.



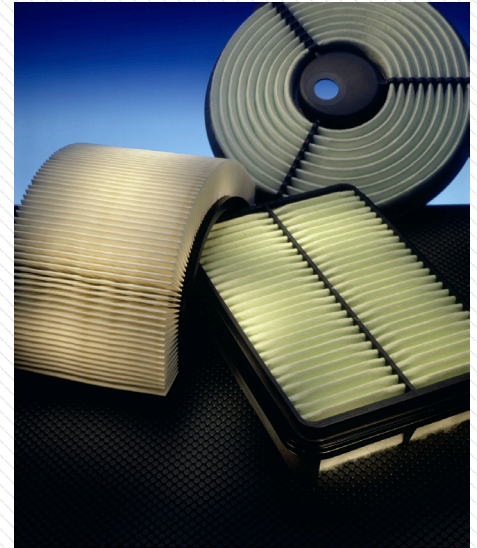
## 6. How to replace an air filter

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For help, view pictures of [how to replace an air filter](#).

The engine air filter prevents dirt from entering the engine through the air intake system. A clean air filter allows the proper amount of air flow into the engine to keep the motor running smoothly and efficiently. If your car has high miles and the air filter has never been replaced, the filter probably has a build-up of dust and dirt which can restrict the flow of air. That's why it's important to replace your air filter periodically.

- Step 1** Open the hood and locate the air filter box.
- Step 2** Remove the clips or the mounting screws from the filter box cover to open.
- Step 3** Lift the cover and remove the old air filter. Make a note of the direction in which the filter is facing for reference when installing the new one.
- Step 4** If the filter box is dirty, use a shop vacuum to remove excess dirt and debris and wipe the inside with a damp cloth.
- Step 5** Install the new air filter into the filter box.
- Step 6** Re-install the filter box cover.
- Step 7** Re-install the clamps or tighten the screws to secure the air filter box cover. Make sure it is closed and sealed correctly.
- Step 8** Be sure the hose connections to the filter box cover are tight and secure.



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# Car Maintenance and Repair Tips & Tricks You Probably Don't Know but Should

- 1 Did you know...you don't need to use the highest grade of gasoline for your car's engine to perform its best? The common opinion among experts is that the difference in quality between different grades of gasoline today is very small, so don't waste your money by filling up with premium gasoline unless your car "requires" it (if this exact wording is stated in your owner's manual).

[Click here to learn more fuel efficient drive tips](#)

- 2 Did you know...you can check for tire wear and tear by using a simple penny? Hold a penny at the base between your thumb and forefinger so that you can see the top of President Lincoln's head and the words "In God We Trust." Place the top of Lincoln's head into one of the grooves in your tire tread. If any part of Lincoln's head is covered, you have a legal and safe amount of tire tread left and your tires probably don't need to be replaced. However, if there is any space above Lincoln's head, or if you can see any part of the words "In God We Trust," it's time for new tires.

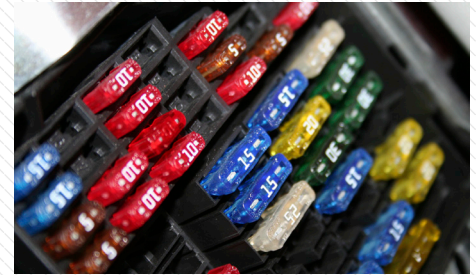
For even more tire care tips, [click here](#).



- 3 Did you know...you should change your oil every 5,000 miles? Experts used to recommend an oil change every 3,000 miles, but most of today's new cars don't require an oil change that often. A good rule of thumb is this – if your car is older than a 2002 model year, you should probably change your oil every 3,000 miles. If it's newer than a 2002 model, it's fine to change your oil every 5,000 miles.

4

Did you know...if something electrical in your car stops working, it might be a blown fuse? Identify which electrical part isn't working. Using the owner's manual, locate the fuse box. Then, locate the fuse for the part that isn't working. Remove the blown fuse with a plastic fuse removal tool, usually located in the fuse box. Install a new fuse with the same amperage rating. Test the electrical part for proper operation to verify the repair. For help, view pictures of [how to replace a fuse](#).



5

Did you know...if your Check Engine light is blinking while you're driving, you should pull over immediately? The Check Engine light can signal any number of system failures, from a fuel vapor leak caused by a loose gas cap to a faulty O2 sensor. If the light comes on and stays on without flashing - yet the car seems to be running smoothly - chances are your car can be examined by a mechanic when you get home. On the other hand, if the Check Engine light is blinking while you're driving, pull over or get to a mechanic right away. A blinking check engine light usually indicates a severe misfire that could damage your car's expensive catalytic converter.

For more tips on car maintenance, [click here](#).



6

Did you know...you shouldn't top off your gas tank? Topping off your gas tank can actually cause extra gasoline to be fed back into the gas station's holding tanks. That means you could actually be spending more money for gas in the long run – extra gas your car won't use. What's more, overfilling your gas tank can cause harmful vapors to be released into the environment. And gasoline needs room to expand, so if you top off your tank, the extra gasoline can evaporate into your car's vapor collection system, causing your engine to run poorly.



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# Teen Driver Car Maintenance and Repair Guide

## Car Repair Safety Tips

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- Always wear safety glasses when repairing your vehicle, in addition to other personal protective equipment such as latex gloves and closed to shoes.
- Never smoke cigarettes when repairing your car.
- Be sure the parking brake is on and the gearshift is in Park or Neutral when repairing or maintaining your vehicle. Always shut off the engine ahead of time, unless it has to be running in order to make the repair.
- Unless a warm engine is required for a repair, make sure the motor is cold to avoid burns.
- Always properly block the wheels of your car before putting it on a car jack.
- Always disconnect the negative battery cable, when performing electrical work.
- Remove jewelry and tie back long hair before making repairs.
- When using toxic substances such as engine coolant or engine cleaners, exercise caution around your hand, mouth and eyes. Wear safety glasses as well as other personal protective equipment such as latex gloves and closed toe shoes whenever possible. Always wash your hands after using toxic substances and be sure to store them safely away from children or pets. Keep all hazardous materials, such as gasoline, away from open flame.
- Make sure your work space is well ventilated and whenever possible, work outside. If you work inside, keep the door open and your car as close to the door as you can.
- Always have a fire extinguisher nearby and be sure you know how to properly operate it. Keep one in your garage and one in your vehicle.

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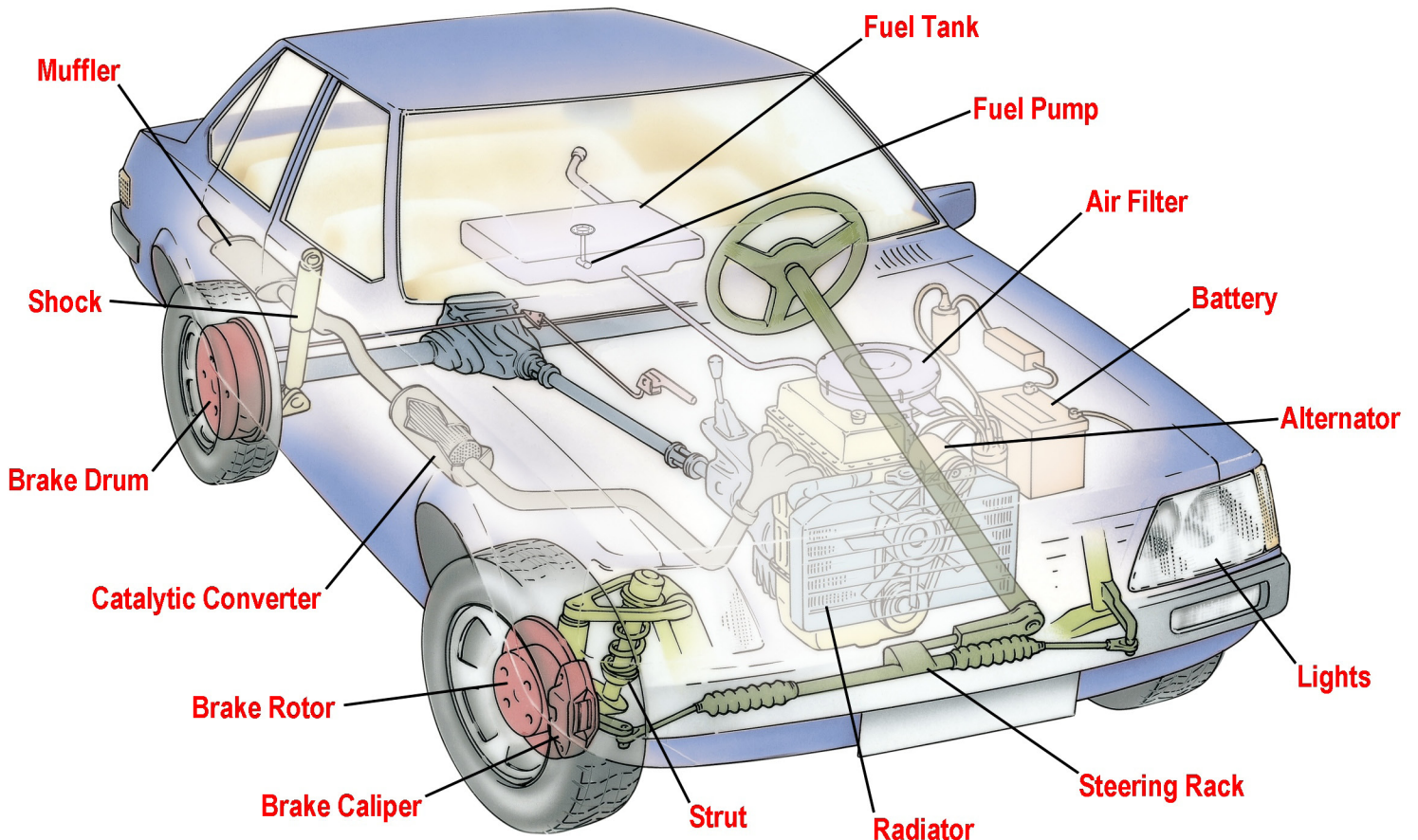
# Roadside Safety Tips

- If your car stops running properly and if you can, move your vehicle to the right-hand side of the roadway as soon as possible. Avoid stopping your car in an active traffic lane.
- Immediately turn on your emergency flashers.
- Once stopped, use flares or hazard triangles to alert other motorists of a problem and place the flare or triangle approximately 50 feet behind your car to give other motorists adequate notice.
- Use the door on the opposite side of the roadway to exit and enter your vehicle. If you can't, leave enough space to open your door without stepping near, or in the way of, moving cars.
- Carry items such as flashlights, flares or hazard triangles, a first aid kit and blankets in your car. And don't forget to have a working cell phone in your possession at all times, in case of an emergency.
- Carry tools such as a jack, wrenches, screw drivers and a spare tire in your car. Be sure to know how to use the tools – and how to make basic repairs – in case of a roadside breakdown.
- If you have a flat tire or a tire blowout, pull onto a flat area if possible so you can safely and properly use the car jack.
- Turn your steering wheel in the opposite direction of the road so your vehicle doesn't accidentally roll into traffic.
- Raise your car hood or tie a white cloth to your door handle to signal police help or assistance from passersby.
- If you're waiting for help, stay inside the vehicle with your doors locked and your seatbelt fastened.
- Exercise caution when accepting help from strangers. If you are suspicious, don't open your door. Instead, lower your window enough to talk and let them know help is on the way, or to ask them to make a phone call for you.



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# Vehicle Diagram & Glossary



## GLOSSARY

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**Muffler** – The muffler is a device in the exhaust system used to reduce noise. It is located under the back half of the vehicle.

**Fuel tank** – The fuel tank is your car's storage container for gas.

**Shock** – The shock absorber is a hydraulic device that dampens spring oscillations. It is mounted behind each tire and wheel assembly.

**Fuel pump** – The fuel pump is an electrical or mechanical device that pumps fuel from the fuel tank to the injectors or the carburetor. Most vehicles are fuel injected, and have an electric pump located inside the fuel tank.

**Brake drum** – Brake drums are made of cast iron and found mostly on the rear axle. When you press on the brake pedal, the brake shoes are forced against the inside of the drums to stop the wheels from turning.

**Air filter** – The air filter prevents dust and dirt from entering the engine through the air intake system. The air filter is located in a housing that is attached to the throttle body or carburetor.

**Catalytic converter** – The catalytic converter is an emission device located in the exhaust system near the exhaust manifold. It reduces the amount of pollutants coming out of the exhaust pipe.

**Battery** – A vehicle battery is a rechargeable 12-volt storage device that is usually located in the engine compartment. The battery provides power to start the vehicle, and power electrical components while the engine is not running.

**Brake rotor** – The brake rotor, or brake disc, is attached to the wheel hub and rotates inside the brake caliper assembly. When you press on the brake pedal, the caliper pistons force the brake pads against the rotors to stop the wheels from turning.

**Alternator** – The alternator is an AC generator that produces electrical current to charge the battery and run the electrical system. It is usually belt driven and mounted on the front of the engine.

**Brake caliper** – The brake caliper is located behind the tire and wheel assembly. It is a major component of the disc brake system. The brake caliper forces the disc pads against the rotor.

**Lights** - Your car's headlights, taillights, brake lights and turn signals are essential in not only helping you see clearly while driving, but in helping others see you clearly too.

**Strut** – The strut locates the suspension position, and typically combines the shock absorber with the coil spring. It performs the same dampening function as a conventional shock absorber.

**Steering rack** – A lightweight steering gear that uses a horizontal bar to turn the wheels.

**Radiator** – The radiator cools and stores the engine coolant. It is usually mounted on the front of the engine compartment.

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