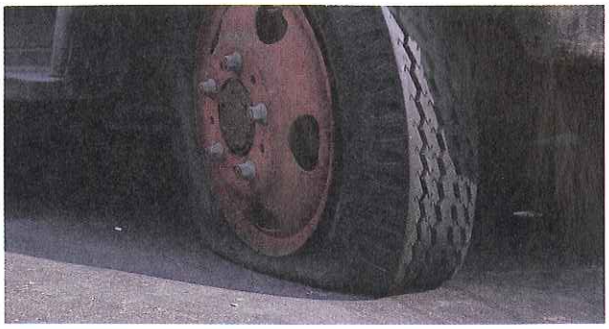
CHAPTER 14 OBJECTIVES

LESSON ONE

Brake, Engine, and Steering Failures

1. Describe what to do in case of brake failure.
2. Explain what to do in case of engine stalling or other engine failure.
3. Describe what to do in case of steering failure.

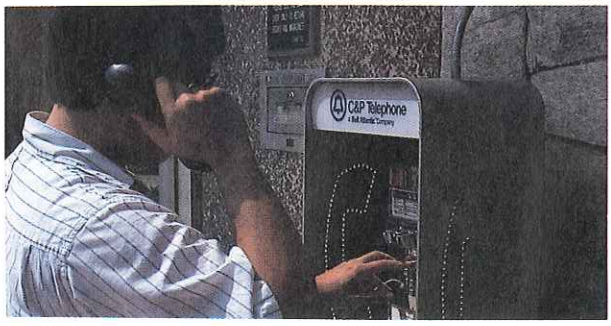
LESSON TWO



Tire Failure and Other Serious Problems

4. Explain what actions to take if your car has a blowout or flat tire.
5. Tell what to do if the accelerator pedal sticks.
6. Describe what to do if the hood flies up.
7. Explain what to do if your car catches fire.
8. Tell how to jump-start a dead battery.
9. Tell what to do in case of headlight failure.

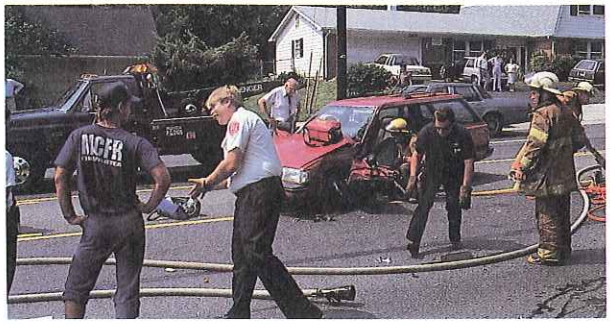
LESSON THREE



Waiting for Help and Protecting the Scene

10. Describe what to do while waiting for help when your car breaks down.

LESSON FOUR



First-Aid Guidelines and Procedures

11. List several basic first-aid guidelines.
12. Describe procedures for controlling bleeding, treating shock, and restoring breathing.
13. List the items that should be in a first-aid kit.

LESSON ONE

Brake, Engine, and Steering Failures

SAFETY TIPS

In an emergency situation, try to stay calm, think clearly, and act quickly. Learning what to do in case of car failure will help you avoid panic.

You see the stop sign at the intersection ahead and step on the brake. The pedal goes all the way to the floor, but the car doesn't slow down. Two teenagers start across the street. Your mind races: *"What should I do?"*

Emergencies can occur suddenly and without warning. Brakes can fail, engines can stall, steering systems can malfunction. If you're prepared to deal with such emergencies, however, you can keep a dangerous situation from becoming a tragedy.

What Actions Can You Take When Your Brakes Fail?

Learn how to deal with emergency vehicle failures to manage risk.

All new cars have a dual-service brake system. Some cars operate with separate systems for the front and back wheels. Other cars use an "X" system, which links each front wheel with its diagonal rear wheel. Total failure of both systems at once is very unlikely, although partial or temporary brake failure does happen occasionally.

In Case of Brake Failure

When brake failure occurs, the foot brake may have no resistance. The brake pedal may sink to the floor and the brake warning light may come on. Here's what to do.

1. Rapidly pump the brake pedal. Doing so may build up pressure in the brake-fluid lines, providing some braking force. After a few pumps you'll know whether or not you've restored braking power.
2. Shift down to a lower gear to slow the movement of the car.
3. If pumping the brakes doesn't work, use the parking brake. Either keep your thumb on the release button or hold the brake handle so that you can alternately apply and release brake pressure for a smooth stop. Applying the parking brake too abruptly may lock the rear wheels—the only ones the parking brake affects—and send the car into a spin. Use an apply-release-apply-release pattern with the parking brake to slow down the car.
4. If you still have little or no brake control, look for a place to steer against the curb. Scraping the

Tips for New Drivers

Emergency Items

It's wise to keep emergency items in the trunk of your car. Include such items as these:

- flashlight with extra batteries
- jumper cables (for starting a dead battery)
- flares, warning triangles, or reflectors
- coolant
- windshield-washer fluid
- wiping cloth
- ice scraper, snow brush, and snow shovel
- jack with flat board for soft surfaces
- lug wrench (for changing a flat tire)
- screwdriver, pliers, duct tape, and adjustable wrench for making simple repairs
- extra fan/alternator belt
- extra fuses (if needed for your car)
- fire extinguisher
- heavy gloves
- blanket
- drinking water
- first-aid kit
- pencil and notebook (for recording emergency information)

tires against the curb can help reduce speed.

5. Other ways to slow the car after you've applied the parking brake and downshifted include steering into an open area, such as a parking lot, and shifting into lower gears as quickly as possible; steering onto an uphill road; and turning the ignition to the off position —*not* the lock position, which would lock the steering wheel.
6. If you can't avoid a collision, steer so that you sideswipe an object rather than hit it head-on. If possible, steer into bushes or scrape along a guardrail or even parked cars rather than move toward pedestrians or occupied vehicles.

Note: If your car has power brakes, engine failure or a broken drive belt may cause brake malfunction. If that's the case, your brakes will still work, but you'll have to press harder on the pedal.

Other Brake Problems

If you apply your brakes hard for a long time, such as when traveling down a long mountain slope, you could overheat them and cause "brake fade," a kind of temporary brake failure. To help prevent this, shift to a lower gear before starting down the slope. You can also pull off the road to let your brakes cool.

Drive more slowly through puddles. Driving at normal speeds through deep puddles or on flooded roadways can make your brakes wet and lead to temporary brake failure. To dry your brakes, drive slowly with your left foot gently on the brake pedal. The friction will produce heat that will dry the brakes.

ENERGY TIPS

Power equipment and accessories add to the total weight of a car. This extra weight, in turn, leads to reduced fuel efficiency.

How Can You Respond to Engine Failure?

Engine failure occurs more often than any other kind of car failure. Engines fail for many different reasons, such as a broken timing gear, a fuel system problem, lack of fuel, an electrical system malfunction, or problems caused by extreme heat or cold.

If Your Car's Engine Stalls

If your car's engine stalls (stops suddenly) while you are driving, check traffic around you and determine the best point to leave the roadway. Signal, then steer off the road or to the curb as quickly as possible. Keep in mind that if your engine stalls, and you have power brakes and power steering, the brakes and steering will still work but will be much harder to operate. If your car has power brakes, do not pump the brake pedal. Use firm, steady pressure instead. When you are off the road, shift to Neutral, and try to restart the engine. If the engine starts, shift into Drive and continue driving. If you're driving a car with a manual transmission, shift into First gear and continue moving forward.

If the engine won't start, make sure your flashers are on, and raise the hood. Place flares or warning triangles 100 feet in front of your car and at least 100 feet behind it. Signal or wait for help.

SAFETY TIPS

To prevent your brakes from getting wet when driving through deep water, apply pressure to the brake pedal as you move slowly through the water.

Your car's engine may stall and your brakes may get wet in rainy weather.

If You Flood the Engine

If you pump the accelerator more than once when trying to start your car, too much gas and not enough air may be supplied to the engine. The result is a flooded engine that won't start. When your engine is flooded, you can often smell gas.

To start a flooded engine, press the accelerator pedal all the way to the floor and hold it there. At the same time, turn the ignition switch on and hold it on for 5 to 10 seconds. If the car starts, slowly release the accelerator. If it doesn't start, wait about 10 minutes and try again.

If the Engine Overheats

Your engine may overheat for any of various reasons: driving in slow-moving traffic during hot weather, with the air conditioner running; driving up long, steep hills; a loose or broken fan belt; a broken water pump or hose; not enough coolant or antifreeze in the cooling system; a stuck or broken thermostat; or a clogged radiator.

When engine temperature is too high, the temperature gauge or warning light on your instrument panel indicates that the engine is overheating. You may also see steam or smoke rising from under the hood.

If your engine overheats, follow these steps.

1. Turn off all accessories, especially the air conditioner.
2. If the temperature gauge continues to show hot or the warning light stays on, signal and pull off the road. Raise the hood, let the engine cool, and get professional help.

▲ *Be careful not to burn yourself when you check an overheated engine.*

If you can't pull off the road immediately, turn on the heater to draw heat from the engine. Doing so will not solve the problem, but it will help temporarily until you can get off the road safely.

3. If there is no steam or smoke coming from the engine, carefully open the hood (wear gloves to protect your hands). Look for such problems as a broken hose or belt. Note whether the radiator overflow tank is empty, but do not touch the radiator.
4. When the engine has cooled completely, check the fluid level in the radiator overflow tank again. If the fluid level is low, you need to add coolant. Many overflow tanks have a fill line to help you determine the proper level of fluid. Start the engine, and let it run at idle speed as you add the coolant.

If the Engine Is Wet

If you drive through water, your car's engine may get wet, start to sputter, and stall. The water may short out your car's electrical system or be drawn into the combustion chamber by way of the air filter and the carburetor.

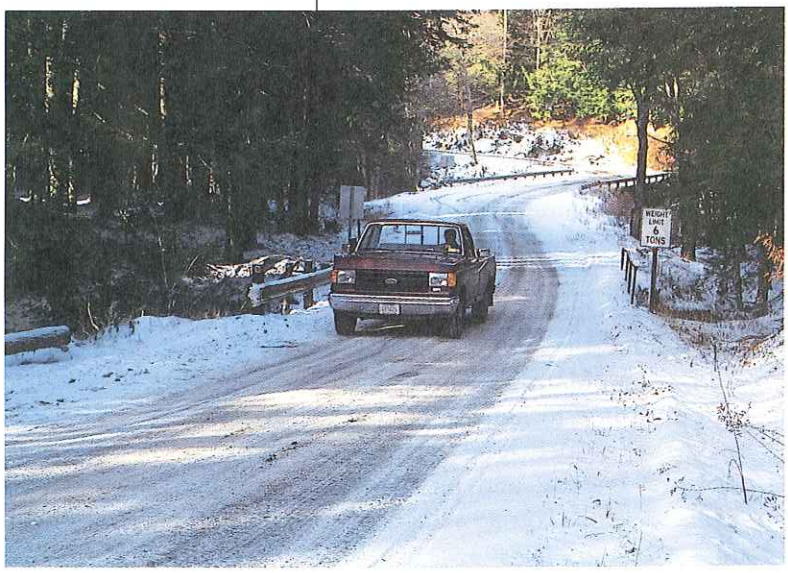
If your engine gets wet and stalls, steer off the road and turn off the ignition. Wait a few minutes, keeping the hood closed to let the heat of the engine compartment dry out the moisture. Then try to restart the engine. If it doesn't start, the engine may need more time to dry. If it's a hot, sunny day, you may speed up the process by raising the hood.

WHAT WOULD YOU DO?

As you prepare to slow your car, you find that the brakes don't catch and the car does not slow down. What do you suppose has happened? How would you handle this situation?

What Actions Can You Take When Your Steering Fails?

Two kinds of steering failure are possible: power-assist failure and total steering system failure. The former is far more common than the latter.



If Power Steering Fails

Power-steering failure can occur if your engine stalls or the power-assist mechanism fails. When power steering fails, your steering wheel suddenly becomes very difficult to turn.

If your car's power steering fails, grip the steering wheel firmly and turn it with more force. Check surrounding traffic, signal, and when it's safe to do so, steer off the road and stop. As soon as you possibly can, have a mechanic check your steering system.

Total Steering Failure

Sudden and total steering failure is a rare occurrence. However, if a breakdown in either the steering or suspension systems does happen, your ability to control your car will be drastically reduced.

In case of total steering failure, bring the car to a stop as quickly and safely as you can, using the parking brake, not the foot brake. Stepping on the foot brake might cause your car to pull sharply to one side. Just as when responding to brake failure, keep hold of the parking brake release button or handle to avoid locking the rear wheels and going into a spin. Downshift.

CHECKPOINT

1. What actions would you take if your car's brakes failed?
2. What would you do if your engine stalled while you were driving? What if the engine overheated?
3. What would you do if your car's power steering suddenly failed?

LESSON TWO

Tire Failure and Other Serious Problems

A car is a complex machine that must endure years of stop-and-go driving, rough roads, and harsh weather. No matter how well you maintain your car, there's always the possibility that a part may break or a system may malfunction.

In addition to the major car failures you read about in the previous lesson, you should be prepared to deal with a number of other serious problems.

What Actions Can You Take in Case of a Blowout or Flat Tire?

A blowout and a flat tire are similar but not the same. A blowout is an explosion in a tire while the car is in motion. The tire suddenly loses air pressure, and the car may become difficult to control.

A tire can also lose pressure gradually, through a slow leak. If you don't detect the leak in time, the tire is likely to go flat. A tire can go flat either while the car is parked or when the car is moving.

If Your Tire Loses Pressure

When a tire fails while you are driving, you may feel a strong pull to the right or left. The rear of your car may shimmy or swerve back and forth. You may even hear a thumping sound. The effect may be gradual if the tire has a slow leak, or sudden if the tire blows out.

Tire failures are fairly common. You should become familiar with emergency procedures for handling tire failure.

If a tire loses pressure, do this:

1. Keep a firm grip on the steering wheel with both hands.
2. Release the accelerator slowly. Don't brake—you could make the car swerve out of control.
3. Check the traffic around you. When you find a gap, signal and steer off the road. You'll have to change the tire, so move as far off the main roadway as you can. As the car slows, brake gradually and come to a stop on a flat surface.
4. Shift to Park (Reverse in a manual-shift car), set the parking brake, and put on your emergency flashers.
5. Get out of the car and have passengers get out too.

How to Change a Tire

Changing a tire is not hard, but it does require caution to change one safely. Between 300 and 400 people are killed yearly while changing tires when the car falls off the jack and onto them or they are struck by passing vehicles.

Position your car on a flat, hard surface as far from traffic as possible. Set out flares or warning triangles at least 100 feet in front and back to alert other drivers.

Use two rocks, bricks, or pieces of wood (each at least 4 inches by 8 inches by 2 inches) to block the wheel that is diagonally across from the flat tire. Put one block in front of the wheel and another behind it. The blocks will keep the car from rolling when it is jacked up.

You'll find complete instructions for changing a tire in your owner's manual or inside the trunk of your car. Here are the basic steps.

1. After the wheel blocks are in place, remove the jack, lug wrench, and spare tire from your trunk and place them near the flat tire.
2. Assemble the jack and position it according to instructions in the owner's manual. Jack up the car until the flat tire is just in contact with the ground.
3. Remove the hubcap or wheel cover from the wheel you're changing. Use the lug wrench to loosen the lug nuts enough so that they'll move easily, but do not remove the nuts.
4. Jack the car up until the tire clears the ground.
5. Take off the lug nuts and put them inside the hubcap or in some other safe place.
6. Pull off the wheel with the flat tire. Replace it with the spare tire. Put the lug nuts back on by hand, and tighten them slightly with the wrench.
7. Carefully let the car down, and remove the jack. Tighten the lug nuts as tight as you can with the lug wrench.

When you change a tire, get as far off the roadway as you can. Then continue to check for traffic in the lane nearest you.

8. Put the flat tire, jack, wrench, and other equipment in the trunk.
9. If the spare is an undersized tire or limited-mileage tire, drive no faster than 50 mph to the nearest service station. Have the flat tire repaired or replaced right away.

What Should You Do If Your Accelerator Pedal Sticks?

As you're driving along, you decide to decrease speed. You lift your foot from the accelerator but nothing changes; the car keeps moving at the same speed. The problem is a stuck accelerator: The engine does not return to idle when you take your foot off the pedal.

A stuck accelerator pedal may be caused by a sticking linkage or accelerator spring, a broken engine mount, a crumpled floor mat, or ice or snow on the floor around the pedal. Here's what to do:

1. Apply the brakes, and shift to Neutral. The engine will race, but power will be disengaged from the wheels.
2. Check traffic and signal a lane change.
3. Choose a safe path, and steer off the road, continuing to apply the brakes.
4. When you are off the roadway, turn off the ignition and apply the parking brake.
5. Don't attempt to unstick the pedal until after you've steered off the road and come to a stop. Test the pedal before reentering traffic. If the pedal problem is mechanical, have it repaired before driving again.

Tips for New Drivers

15-Minute Checkup

To keep your car in good working order, follow the suggestions in your owner's manual for periodic checkups and maintenance. In addition, if you drive 10,000 or more miles a year, do a 15-minute check of the following items every month.

- all lights for burned-out bulbs
- the battery fluid level or, if your car has a sealed battery, the green battery-charge indicator
- the engine oil level and transmission fluid level
- the brake pedal for firmness and proper operation
- the brake fluid level
- the air pressure in all tires
- the tires for uneven wear
- the cooling system
- the hoses and belts that operate the fan, compressor, and the like
- the windshield washer and wipers
- the power steering fluid level

What Should You Do If the Hood Flies Up?

Anything that blocks your forward view is a threat to your safety. If the hood of your car suddenly flies up while you're driving, you must take action to avoid a collision and get off the road.

1. Lean forward and look through the space between the dashboard and the hood. If this view is blocked or limited, roll down your side window and look around the hood. Don't lean out the window so far that you lose control of the pedals. Continue to steer in the direction you were moving.
2. Check your mirrors to see what traffic is behind you. Check the traffic to either side of you.

3. Signal to indicate the direction you want to move. Maintain your lane position while waiting for a gap in traffic. Then steer off the road.

What Actions Can You Take If Your Car Catches Fire?

Car fires don't occur often, but when they do they require prompt action to minimize risk to people and property.

If the Engine Catches Fire

Engine fires are usually fuel-fed or electrical. If a fire suddenly erupts in your engine while you're driving, you'll see and smell smoke coming from under your hood. Follow these steps.

1. Steer off the road to an open space. Turn off the ignition.
2. Get out of the car, and have all passengers get out too. Move far away from the car. Call for help.
3. Decide how serious the fire is. If it is serious—high heat and flames around the hood—don't attempt to put the fire out yourself. Stay far away from the car, and wait for the fire department.
4. If the fire is not serious and you have a fire extinguisher in the trunk, you can try to put it out yourself. *Don't use water;* it is not effective against fuel and oil fires. Wear gloves, or wrap your hands in cloth. Turn your face away from the car, and crouch down so that your head is at the level of the hood. Do not open the hood. Just pull the hood release to create a small space into which you can spray the extinguishing agent.

Get out of the car as soon as you safely can if your car catches fire.

If There Is a Fire in the Passenger Compartment

A fire in the passenger compartment is usually caused by carelessness on the part of a passenger or the driver. A common cause of such fires is a burning cigarette or match that drops to the floor or gets blown into the backseat.

If there's a fire in the passenger compartment, you'll smell something burning, and you may see smoke. Steer off the road, and stop clear of traffic. Turn off the ignition. Get out of the car, and have all passengers get out. Use a fire extinguisher or water to put out the fire.

What Should You Do If Your Car's Battery Is Dead?

It's a freezing-cold winter night. After leaving the movie theater, you and your date rush out to your car.

You turn the ignition switch to start. Nothing happens—no sound, no engine turnover, nothing. Your car's battery has gone dead.

A battery may go dead if you keep your headlights on or play the radio for a long time while the engine is not running. An old battery may no longer have enough power to start a car in very cold weather.

If the battery is dead, you can't start the engine. However, you may be able to restore power to your battery by using jumper cables (or "booster cables") to connect it to a working battery in another car.

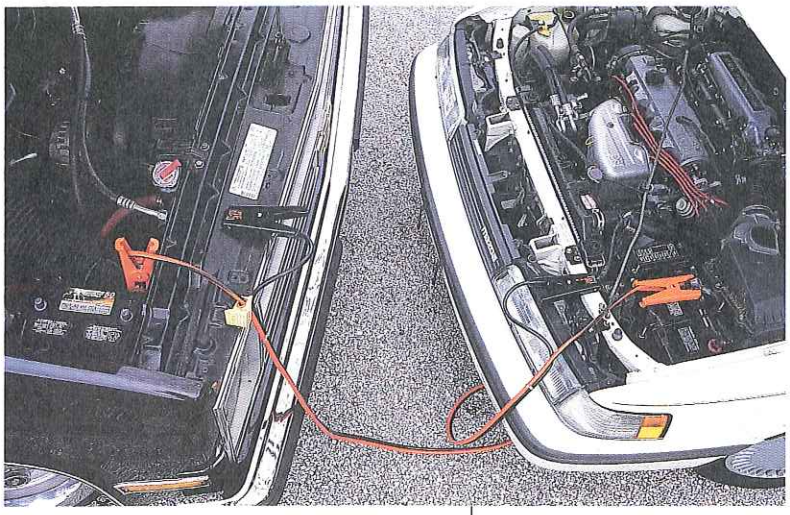
Jump-Starting Your Car

The most common way to recharge your battery is to jump-start it. To do this, you need another car with a working battery that is the same voltage as yours and a pair of jumper cables.

Before you decide to jump-start your battery, make sure the battery fluid is not frozen or the level of fluid low. If it is, do *not* attempt to jump-start your battery: It might explode.

To jump-start your car, follow these steps.

1. Position the cars so the cables can reach between the two batteries. Don't let the cars touch.
2. Turn off the ignition and electrical equipment in both cars. Shift both cars into Park or Neutral, and put their parking brakes on.
3. Double-check to make sure both car batteries have the same voltage (usually 12 volts).
4. If either battery has cell or vent caps, remove them. Check again to make sure your dead battery is not frozen.
5. Cover each battery with a heavy cloth to protect against splashing of boiling battery fluid.
6. Attach the positive jumper cable (red, or marked P or +) to the positive terminal of the good battery. Clamp the other end of the same cable to the positive terminal of the dead battery.
7. Attach the negative jumper cable (black, or marked N or −) to the engine or frame of the car with the good battery. Be sure the cable does not touch the fan or drive belts.
8. Attach the other end of the negative cable to the engine or frame of the car that has the dead battery. Make this connection as far from the battery as possible and far from moving parts, such as the fan.
9. Start the engine of the car that has the good battery. Hold down the accelerator so that the engine runs at a high idle.
10. Start the engine of the car with the dead battery and, with the cables still attached, run it for several minutes.



▲ *It's a good idea to keep jumper cables in the trunk of your car.*

11. With both engines still running, remove the cables in reverse order from the order in which you attached them. (Remove negative first, then positive.)
12. Replace battery caps if they've been removed, and dispose of the cloth covers in case they contain acid.

What Should You Do If Your Headlights Fail?

Headlight failure at night is dangerous because without lights, your ability to see is reduced, as is the ability of other drivers to see your car.

Rarely do both headlights fail at the same time. However, if one headlight goes out, you may not notice it until the other goes too. Headlight failure is usually the result of a burned-out low-beam headlamp.

If you're driving at night and suddenly your lights flicker or die, you have to get off the road, but without making any sudden, possibly dangerous moves. Here's what to do.

1. Slow down and continue in the same direction you were going. Be aware of the traffic around you.
2. Try switching to high beams: Headlights seldom burn out on both high and low beams at the same time. If switching to high beams gives no light, try turning on parking lights, turn indicators, and the emergency flashers. These can give you enough light to help you get off the road.
3. When you see a gap in traffic, steer off the roadway. If you have no lights at all, look for the side-lane markers on the pavement. You can also use available light from other cars on the roadway.
4. If possible, stop your car off the roadway near a lighted place, such as a lighted sign, building, or streetlight. Call for help.

WHAT WOULD YOU DO?

Suddenly your front hood opens, obstructing your vision. What steps would you take to avoid a collision?

CHECKPOINT

4. What would you do if one of your car's tires suddenly lost pressure while you were driving?
5. How would you deal with a stuck accelerator pedal while driving?
6. What would you do if your car's hood flew up while you were driving?
7. How would you respond to an engine fire? To a fire in the passenger compartment?
8. List the steps for jump-starting a dead battery.
9. What would you do if your headlights failed while you were driving at night?

LESSON THREE

Waiting for Help and Protecting the Scene

Raising the hood of your car is one action you can take to let others know you need help.

In an emergency, you may need assistance even though you may be miles from a phone. You may be able to correct a minor mechanical problem yourself. You might also choose to call on passing cars and pedestrians to get the help you need.

What Should You Do at the Scene of a Car Breakdown or Other Emergency?

If your car breaks down, you may be able to remedy the problem yourself—by changing a flat tire, for example. If you can't fix the problem, you'll need to get help.

After pulling out of traffic, you'll have to communicate your situation to passing drivers or pedestrians in a way that keeps you and other roadway users safe.

Make Others Aware of Your Problem

If you have to pull off the road at a place where there's no telephone within safe walking distance, you'll need to get the attention of other drivers. To do this safely—in a way that protects you as well as other drivers—raise the hood of your car, and tie a handkerchief or scarf to

SAFETY TIPS

If your car breaks down on a highway, your immediate goal is to get your car safely off the roadway onto the shoulder. Then set out flares or other warning devices to increase your car's visibility to other drivers.

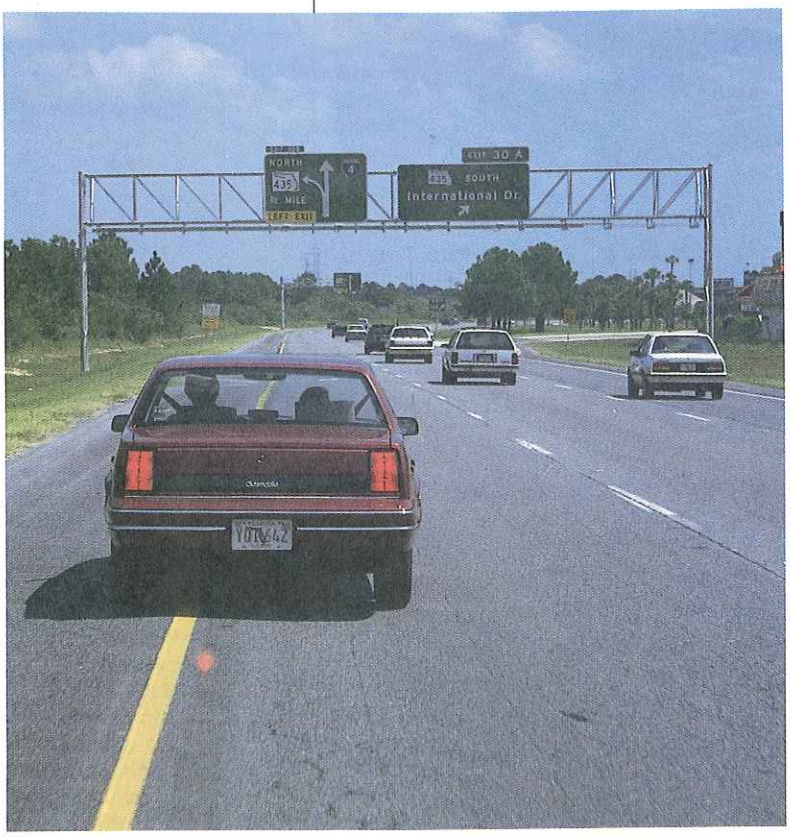
the antenna or left door handle. You can also hold the handkerchief or scarf in place by closing a window on it. Stay in the car if you have pulled well off the roadway. Otherwise, get as far away from the road as you can. Switch on your emergency flashers to alert passing drivers to your situation.

Protect Yourself

You can wait inside your car if the weather is bad and you're far enough off the road. Keep the windows almost closed and the doors locked. Do not sit in a stopped car with windows closed, engine running, and heater on. You could be putting yourself and your passengers at risk of carbon monoxide poisoning.

WHAT WOULD YOU DO?

Your car has broken down and you have moved it to the side of the road. What actions would you take to find assistance?



It is very dangerous to lower your window or open your car door to strangers. If a stranger does stop to offer help, just ask the person to call for emergency road service.

If your car is not far enough from roadway traffic, or if you think it might be struck from behind by another vehicle, leave the car and walk to a safe place. Proceed carefully—especially at night or in bad weather, when visibility is limited.

Never stand behind or directly in front of your car. Other roadway users will have trouble seeing you, and you could be struck by an oncoming vehicle.

Make Decisions When Help Comes

Emergency road service operators can usually change a flat tire or do minor repairs on the spot. They may also have gasoline and a booster battery in case you've run out of gas or have a dead battery.

If you need to be towed to a service garage, you should know whether or not your insurance covers all or part of the towing charge. You should also find out how many miles away the service garage is and what the charge is for towing.

If your car is towed, you'll have to arrange transportation for yourself and your passengers. Passengers are not allowed to ride in a vehicle when it's being towed.

CHECKPOINT

10. What should you do while waiting for help if your car breaks down?

LESSON FOUR

First-Aid Guidelines and Procedures

First aid is emergency treatment given to a person who is injured or ill, before professional medical care arrives. Learning about first-aid procedures may help you prevent further injury or even save someone's life in an emergency.

What Are Some Basic First-Aid Guidelines?

All drivers should have some knowledge of first aid. You can learn first aid by taking a course given by the American Red Cross. You can also read about first-aid procedures in a manual or book. However, to really know what you're doing, you need both training and practice in first aid.

Here are some basic first-aid guidelines for emergency situations.

- Quickly scan the scene and decide if you can help. If you feel confused and uncertain, don't try to give first aid. Call for help.
- The person with the most experience should give first aid. If there are other uninjured people nearby, quickly find out who among you has the most experience with first aid.
- If more than one person is injured, care for the most seriously injured person first.
- Keep calm and act quickly and quietly. Speak in a normal tone of voice. Try not to worry the victim.
- Find out if the injured person is bleeding. Try to stop any serious bleeding as quickly as possible.
- Check that the injured person is

First aid can be given to injured persons before an ambulance arrives on the scene.

SAFETY TIPS

Wear protective equipment when giving first aid to a bleeding or seriously injured person. For example, disposable gloves will decrease the risk of contracting an infectious disease. Keep one or two pairs of disposable gloves in your car's first-aid kit. Consult a first-aid manual for additional information.

FYI

The Good Samaritan Law states that no person who gives emergency care in good faith at the scene of an emergency shall be held liable for civil damages.

Professional medical personnel are the only ones who should move an injured person.

breathing. If not, start mouth-to-mouth resuscitation. (See page 271.)

- *Never* move an injured person unless you must do so for his or her safety. Moving an injured person can worsen the injury. Try to keep injured persons from moving.
- Get trained medical help as soon as possible. However, if you are the only uninjured person at the scene, do not leave the victim in order to get help unless you have no other choice.
- A person who looks uninjured but is unable to move may have an injury to the spine. *Do not* try to move the person. Cover the victim with a blanket, and go for help.
- Take precautions to protect yourself against exposure to an injured person's blood or body fluids.

FYI

A rear-end car collision may cause a *whiplash* injury, in which the victim's head snaps backward, then abruptly whips forward. Such an injury can cause severe neck damage.

What Are Some Specific First-Aid Procedures?

You should learn procedures for controlling bleeding, treating shock, and restoring breathing.

Controlling Bleeding

Someone who is bleeding heavily, or *hemorrhaging,* can die within minutes, so it's very important to try to stop heavy bleeding immediately.

You can control heavy bleeding by applying direct pressure. Remember to wear protective equipment, such as disposable gloves. Put a clean cloth—such as a folded handkerchief or piece of a shirt—directly over the wound and press down firmly. If you don't have a clean cloth, press directly on the wound with your gloved hand. Keep pressing, without lifting your hand, until medical help arrives.

Other means of stopping heavy bleeding are to apply arterial pressure or to use a tourniquet. Do not use either of these methods unless you are fully trained to do so.

Treating Shock

Serious injury, bleeding, or burns can cause shock. When a person is in a state of shock, the blood does not circulate properly. As a result, the brain and other tissues fail to get enough oxygen. Shock can cause death if it is not treated.

A shock victim usually feels faint, weak, cold, and often nauseous. The person's skin will feel cold and clammy and may look pale—even blue. Breathing is irregular, and the pulse is weak and fast.

It is wise to treat seriously injured persons for shock even if they don't show signs. Keep the victim warm with a blanket or coat. Don't overdo it. Try to keep the body temperature near normal. Control any bleeding, and loosen tight clothing. Do not give anything to eat or drink.

Restoring Breathing

Two or three minutes without breathing can cause permanent brain damage. Six minutes without breathing can cause death. To try to restore breathing, apply mouth-to-mouth resuscitation.

1. Place the person faceup. Then kneel down and clear the victim's mouth with your fingers.
2. Put one hand under the victim's neck. Gently tilt the head backward, pushing the chin up. Using your thumb and index finger, pinch the victim's nostrils closed.
3. Put your mouth right over the victim's mouth. Blow air into the victim's mouth until you see his or her chest rise. Remove your mouth. Let air escape from the victim's lungs while you take another breath.
4. Repeat the procedure. You should blow air into an adult's mouth at a rate of about 12 times per minute. For children, the rate should be about 20 times per minute. Continue until you are sure the victim is breathing independently or until medical help arrives.

What Items Should You Include in a First-Aid Kit for Your Car?

Always keep a first-aid kit in your car. The contents of the kit may enable you to save a life—or enable someone else to save your life.

The American National Red Cross suggests that the following items be included in a first-aid kit:

- plastic adhesive bandages (25, in various sizes)
- gauze dressings (12, 4 inches square)

THE HISTORY CONNECTION

In 1881 Clara Barton founded the American Red Cross in Washington, D.C. It is a nonprofit humanitarian organization with the express purpose of preventing and easing human suffering. In 1905 the organization was renamed the American National Red Cross. It made a commitment to provide a worldwide network of emergency relief.

Throughout the 20th century the American National Red Cross has been a pioneer in the field of emergency relief and medical assistance. The organization provided assistance during World Wars I and II, contributing medical supplies, blood plasma, and able-bodied volunteers. Following World War II, the organization launched a program to provide blood to people of all races, colors, and creeds who need it.

During the past 40 years the American National Red Cross has become deeply involved in the field of public health. The organization offers many instructional programs in first aid, lifesaving, nurse's aide training, baby care, and home nursing. Many people serve in first-aid stations and mobile units along highways.

There are now more than 2 million Red Cross volunteers nationwide. In addition, more than 20 million Junior Red Cross members participate in activities geared toward helping people in their communities as well as underprivileged children in other countries.

Advice From the Experts

Loretta J. Martin, Coordinator, Safety and Driver Education, Chicago Public Schools

Loretta J. Martin

Roadside emergencies can happen anytime. You can minimize their consequences if you mentally prepare for them, know how to handle common vehicle failure, and know what to do at the scene of an emergency.

- Don't drive unless you are fit.
- Wear your safety belt.
- Carry an emergency car kit.
- Carry a good first-aid kit and know how to use it.
- Protect the scene.
- Know how to get help quickly.

WHAT WOULD YOU DO?

You have been involved in a collision with another car. You are uninjured, but the other driver is bleeding. How can you help?

- roller gauze bandages (2 rolls, 3 inches wide)
- safety pins (10, in various sizes)
- adhesive tape (1 roll, 1-inch wide)
- scissors
- triangular bandages (5)
- moist towelettes (6)
- combine dressings (3)
- tweezers
- bottle of syrup of ipecac; bottle of activated charcoal (both for use only on advice of medical professional)
- change for phone calls
- pencil and notebook
- disposable gloves

Check the contents of your first-aid kit regularly, and replace any items as needed. Be sure to keep the kit out of children's reach.

CHECKPOINT

11. What first-aid guidelines should you follow in an emergency?
12. What are the first-aid procedures for controlling bleeding, treating shock, and restoring breathing?
13. What items should you include in a first-aid kit for your car?

CHAPTER 14 REVIEW

KEY POINTS

LESSON ONE

1. In case of brake failure, rapidly pump the brake pedal. If that doesn't work, use the parking brake. Downshift.

2. If your engine stalls while you're driving, signal and steer off the road. If your car is in motion, shift to Neutral and try to restart the engine. If the engine won't start, steer near the curb or shoulder and stop.

3. If your car's power steering fails, grip the steering wheel firmly and turn it with more force than usual. Steer off the road and stop. In case of total steering failure, use the parking brake to stop.

LESSON TWO

4. If your car has a blowout or flat tire, keep a firm grip on the steering wheel. Release the accelerator slowly, but don't brake. Steer off the road.

5. If the accelerator pedal sticks, brake and shift to Neutral. Carefully steer off the road.

6. If the hood flies up, look through the space between the dashboard and the hood or out of the driver's side window. Continue to steer in the direction you were moving until you can leave the road.

7. In case of a car fire, steer off the road to an open space. Turn off the ignition. Get out and move away from the car. Call for help.

8. To jump-start a dead battery, turn off the ignition in both cars, shift both into Park, and set their parking brakes. Attach the jumper cables properly. Start the engine of the car with the good battery, then the engine of the other car.

9. If your headlights fail, slow down and switch to high beams. If that doesn't help, turn on the parking lights, turn indicators, and flashers.

LESSON THREE

10. If your car breaks down, let other drivers know you need help. Wait inside your car.

LESSON FOUR

11. Stay calm. See if you can help. Give first aid if necessary, especially to stop bleeding or to restore breathing. Never move an injured person.

12. To control bleeding, apply direct pressure to the wound. To treat shock, keep the victim warm. To restore breathing, give mouth-to-mouth resuscitation.

PROJECTS

1. Borrow a car owner's manual. What special directions does the manual contain for avoiding and responding to car failures and emergencies? What preventive maintenance tips does the manual offer?

2. Interview an emergency medical technician or member of a first-aid squad. Ask what collision-related injuries occur most commonly. Also find out what kinds of first-aid treatments are given most frequently and what new methods, if any, are being used.

CHAPTER 14 REVIEW

BUILDING CRITICAL THINKING SKILLS

Benjamin Banneker

To drivers traveling through the United States, it seems as though many major cities just grew without any plan at all. In many cases, this is true. However, our capital city, Washington, D.C., is one of the few cities in this country that was designed before it was built. This is particularly evident in the area surrounding the United States Capitol, which is located near the center of Washington. Like the spokes of a wheel, broad streets extend out from the Capitol in all directions. This roadway pattern can also be seen near Union Station, the Lincoln Memorial, and Mt. Vernon Square.

President George Washington chose Pierre L'Enfant, a French engineer, to draw up the plans for the new capital. Benjamin Banneker helped L'Enfant to work out the city's plan and to survey, or measure, the size, shape, and area of the land. Banneker was the first African-American ever to be appointed to work for the government.

L'Enfant left the United States before the building of Washington, D.C. was completed, taking the plans with him. However, Benjamin Banneker stepped in and finished laying out the city from memory.

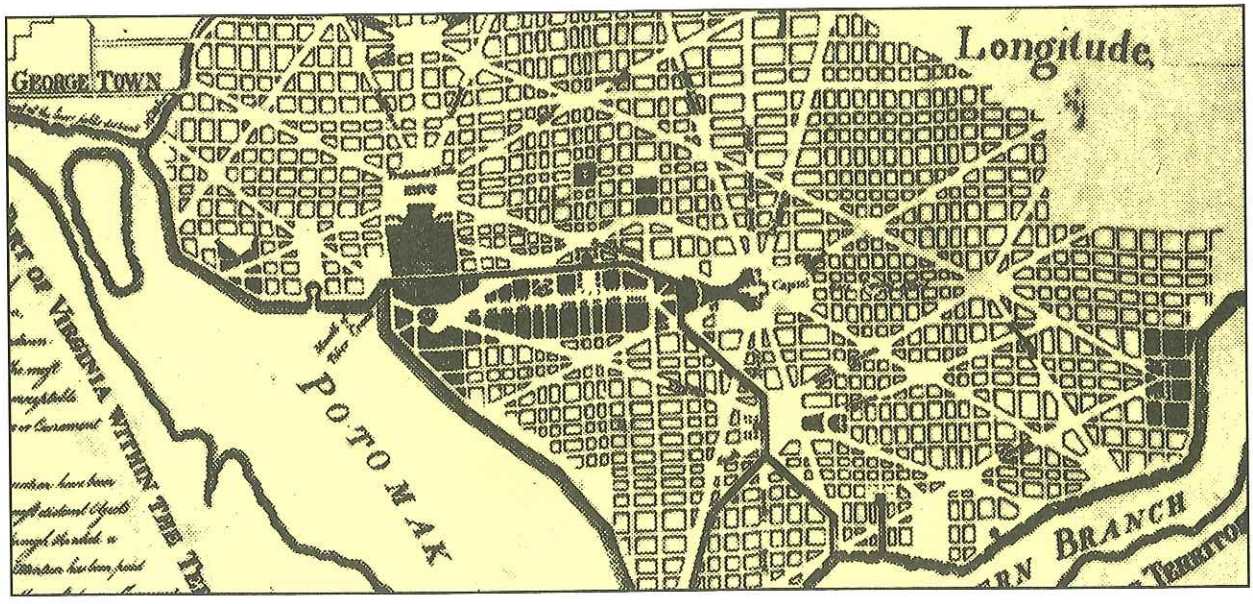
Benjamin Banneker was the son of a free woman and slave father. He was born free in 1731 on a farm in Maryland. Banneker was educated in a Quaker school where he became interested in mathematics and science. He later taught himself astronomy.

Banneker used his knowledge to make astronomical and tidal calculations in order to write a yearly almanac predicting weather conditions. He sent a copy of his almanac to Thomas Jefferson along with a letter urging the abolition of slavery. Those against slavery held Banneker up as an example of the talents and abilities of African-Americans.

In addition to his work on the almanac, Banneker was also fascinated by the workings of clocks. He fashioned a clock entirely out of wood, carving each gear by hand and using a pocket watch as his only model.

What Do You Think Now?

What do you think was the most important accomplishment of Benjamin Banneker? Why?



CHAPTER 14 REVIEW

CHAPTER TEST

Write the letter of the answer that best completes each sentence.

1. If your car breaks down and you pull over to the side of the road, you should
   a. phone for help or get the attention of passing drivers.
   b. stand directly in front of your car until help arrives.
   c. stand in the middle of the road and wave your arms.
2. If your steering wheel suddenly becomes very hard to turn, the problem probably is
   a. power-steering failure.
   b. engine overheating.
   c. wet brakes.
3. If one of your tires suddenly loses pressure,
   a. release the accelerator slowly.
   b. brake hard.
   c. immediately shift into Park.
4. A collision victim who looks uninjured but cannot move
   a. should try to get up and walk around.
   b. may have a spinal injury.
   c. should be moved as quickly as possible.
5. If your battery is frozen and the engine won't start,
   a. use jumper cables.
   b. do not use jumper cables.
   c. turn on the heater before using jumper cables.
6. If the hood flies up while you're driving,
   a. stop immediately.
   b. honk your horn and move right.
   c. look through the space between the hood and the dashboard.
7. If your foot brake suddenly loses power,
   a. turn the ignition to the lock position.
   b. shift into Reverse.
   c. rapidly pump the brake pedal.
8. A victim who feels faint, weak, and cold
   a. needs artificial respiration.
   b. should be kept as cool as possible.
   c. may be suffering from shock.
9. To dry wet brakes,
   a. drive slowly with your left foot pressing gently on the brake pedal.
   b. stamp down on the brake pedal several times.
   c. drive in low gear.
10. To put out a minor engine fire, use
    a. a fire extinguisher.
    b. water.
    c. a heavy cloth.

Write the word or phrase that best completes each sentence.

engine flooding hemorrhaging first aid
cooling system brake fade resuscitation

11. A person who is _____ can die within minutes.
12. Applying your brakes hard for a long time may cause _____.
13. Your engine may overheat if there is not enough coolant in the _____.
14. _____ is emergency treatment given to a person who has been injured.
15. Pumping the accelerator repeatedly when trying to start your car can result in _____.

DRIVER'S LOG

In this chapter, you have learned about how to deal with emergency situations caused by vehicle failures and those in which personal injury is involved. Write two paragraphs giving your ideas on the most important factors to keep in mind when confronted with an emergency.

CUMULATIVE REVIEW

UNIT 3

This review tests your knowledge of the material in Chapters 1–14. Use the review to help you study for your state driving test. Choose the answer that best suits the question.

1. The penalties for DWI and DUI
   a. are the same in all states.
   b. differ from state to state.
   c. are set by the National Highway Safety Act.
   d. are not very severe.

2. When driving at 55 mph, your following distance should be at least
   a. 10 seconds.
   b. 6 seconds.
   c. 4 seconds.
   d. 1 minute.

3. When turning left from a two-way street,
   a. yield right of way to traffic behind you.
   b. yield right of way to oncoming traffic.
   c. use hand signals.
   d. shift into Reverse gear.

4. While driving, you should
   a. aim low and look down.
   b. keep your head moving.
   c. keep your windows open.
   d. keep your eyes moving.

5. Electricity is fed to the engine by the
   a. accelerator.
   b. transmission.
   c. odometer.
   d. alternator.

6. Lane-use lights are mounted
   a. on slow-moving vehicles.
   b. below warning signs.
   c. above reversible lanes.
   d. on telephone poles.

7. The best way to avoid becoming a problem drinker is to
   a. drink only on weekends.
   b. drink beer only.
   c. avoid drinking in the first place.
   d. drink at home.

8. A problem common to rural roads in spring and fall is the presence of
   a. busy intersections.
   b. slow-moving vehicles.
   c. HOV lanes.
   d. smog.

9. A driver can avoid skidding in rainy weather by
   a. changing speed gradually instead of abruptly.
   b. driving between 45 and 60 mph.
   c. frequently changing gears.
   d. riding the clutch.

10. Inertia, friction, and kinetic energy are
    a. difficult to manage.
    b. natural laws.
    c. different words for visibility, time, and space.
    d. culprits.

11. All cars manufactured since 1986 are required to have
    a. air bags and safety belts at all seats.
    b. a third center high-mounted brake light.
    c. power windows.
    d. antilock brakes.

12. To make a turnabout safely, you need
    a. 100 yards of visibility.
    b. 1,000 feet of visibility in each direction.
    c. 500 feet of visibility in each direction.
    d. at least one minute.

13. Friction between the road and a car's tires is called
    a. latex.
    b. adhesion.
    c. centrifugal force.
    d. gravity.

14. If your accelerator sticks, you should
    a. reach down and grab it.
    b. shift to Neutral and steer off the road.
    c. jump out of the car.
    d. pump the brakes.

15. Crosswalks are most frequently located at
- **a.** bridges.
- **b.** steep grades.
- **c.** campsites.
- **d.** intersections.

16. A good driver is one who has learned
- **a.** to eliminate risk completely.
- **b.** how to manage risk.
- **c.** to drive very fast.
- **d.** to read a map while driving.

17. Parking at 90-degrees to the curb is called
- **a.** parallel parking.
- **b.** illegal parking.
- **c.** double parking.
- **d.** perpendicular parking.

18. *Jaywalking* refers to the act of
- **a.** walking across a street without regard for traffic rules.
- **b.** smoking marijuana in public.
- **c.** obeying traffic rules.
- **d.** yielding the right of way to others.

19. Gravity pulls objects
- **a.** toward a collision.
- **b.** across a banked road.
- **c.** toward the earth's center.
- **d.** into kinetic energy.

20. Lanes of traffic moving in the same direction are separated by
- **a.** broken white lines.
- **b.** solid yellow lines.
- **c.** overhead electronic signals.
- **d.** prosthetic devices.

21. When making a right turn, you should wait until there is a
- **a.** 2-second gap to your left.
- **b.** 6- to 8-second gap to your left.
- **c.** 7- to 9-second gap to your right.
- **d.** 12-second gap to your right.

22. You can reduce glare in snowy weather by wearing
- **a.** sun visors.
- **b.** sunglasses.
- **c.** a defroster.
- **d.** a hat.

23. Points at which you can safely enter or exit a limited-access highway are called
- **a.** intersections.
- **b.** HOV lanes.
- **c.** crosswalks.
- **d.** interchanges.

24. As you enter a turn or curve, you should
- **a.** decrease speed.
- **b.** increase speed.
- **c.** maintain an even speed.
- **d.** apply centrifugal force.

25. A way to restore breathing is
- **a.** direct pressure.
- **b.** mouth-to-mouth resuscitation.
- **c.** a tourniquet.
- **d.** an air bag.

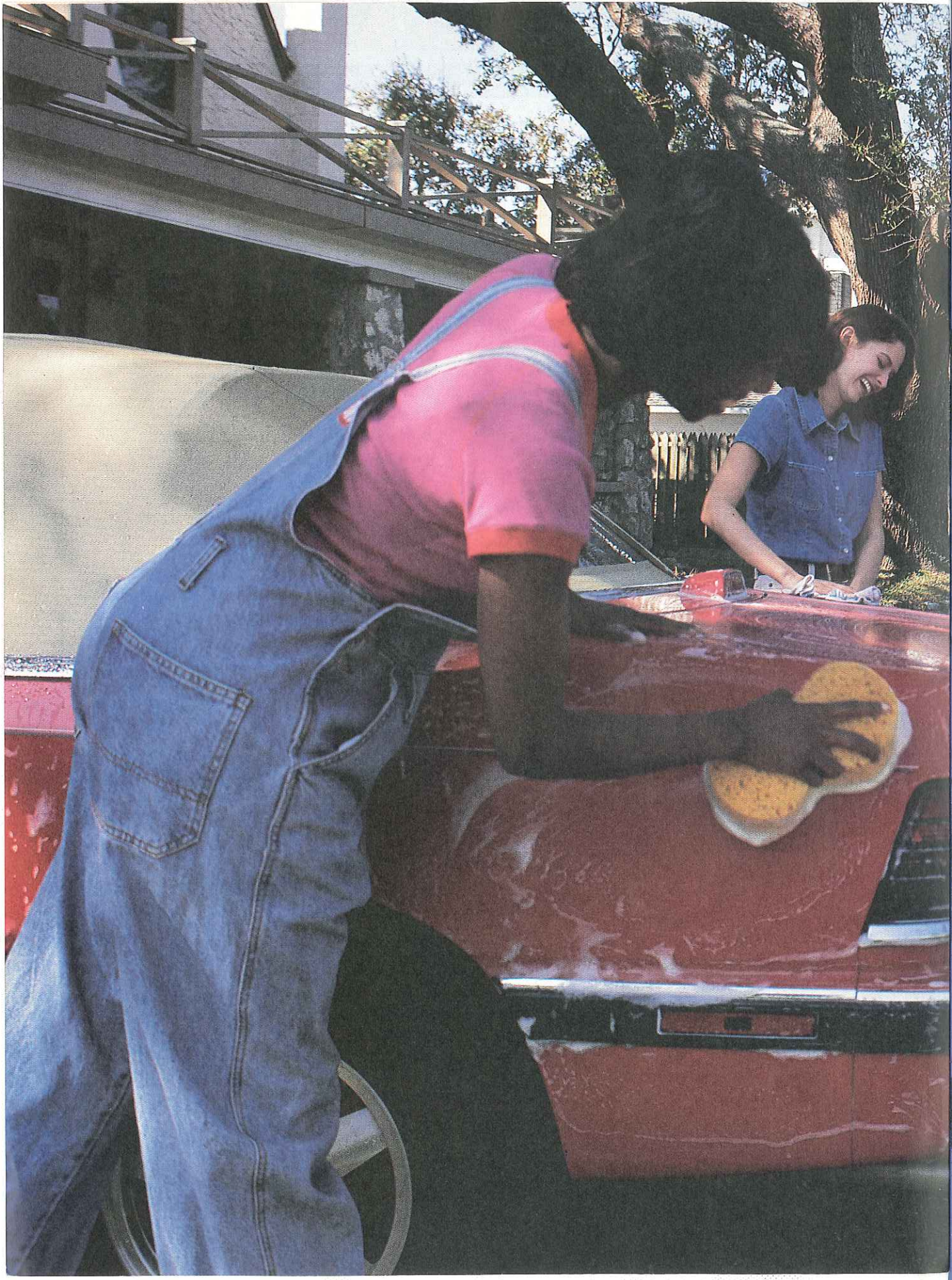
26. A car with a manual shift has
- **a.** an automatic transmission.
- **b.** two brake pedals.
- **c.** a selector lever.
- **d.** a clutch and a gearshift.

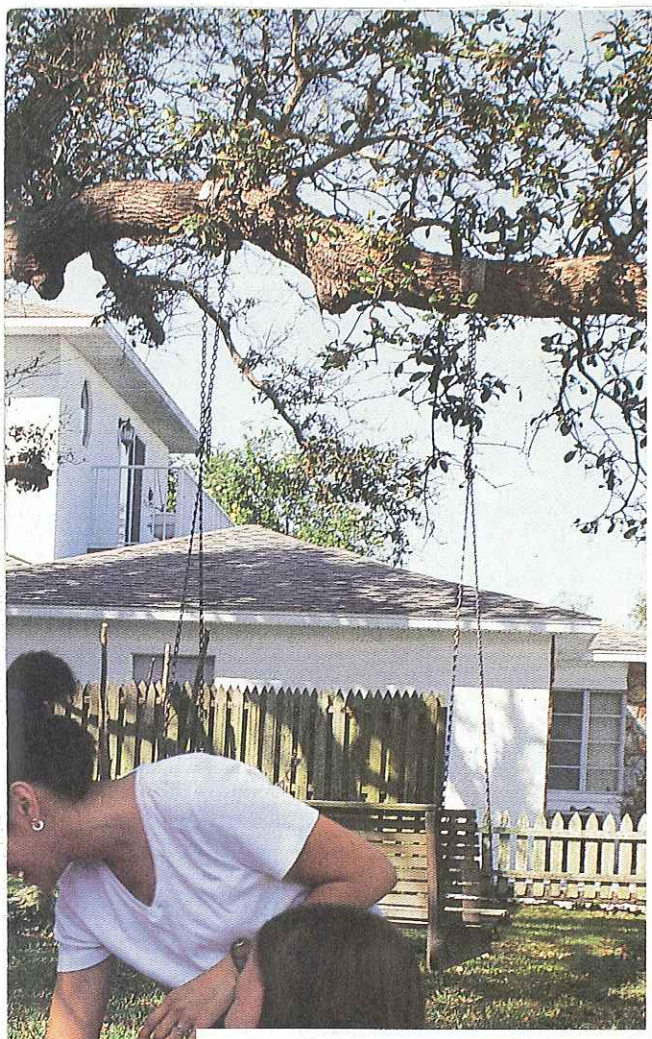
27. A car's rate of acceleration is
- **a.** lower at high speeds.
- **b.** lower at low speeds.
- **c.** perception distance.
- **d.** set by the Uniform Vehicle Code.

28. Truck drivers have poor visibility
- **a.** behind a car.
- **b.** in daylight.
- **c.** at speeds of 55 mph.
- **d.** to the sides.

29. Engine fires are often
- **a.** caused by cigarette smoking.
- **b.** electrical in nature.
- **c.** best ignored.
- **d.** easily extinguished by water.

30. Cyclists are endangered by
- **a.** careless drivers.
- **b.** the SIPDE process.
- **c.** administrative laws.
- **d.** ground viewing.



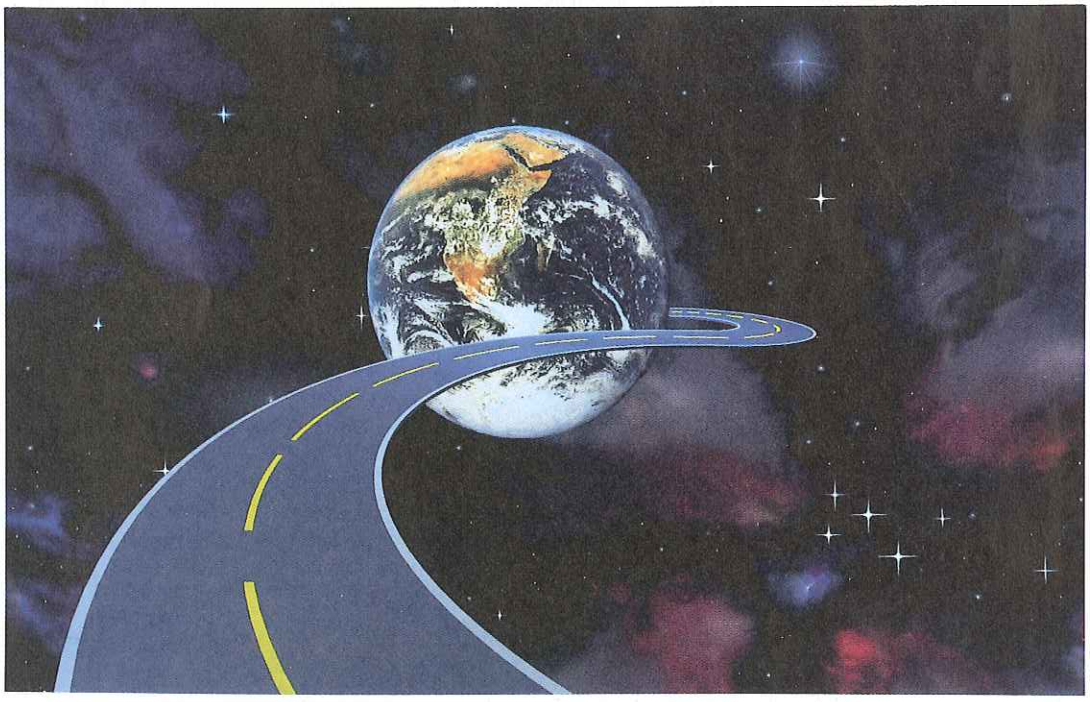


UNIT 4

PLANNING FOR YOUR FUTURE

As a driver, you will make many important decisions. This unit will help you develop guidelines so that your decisions will be based on understanding your needs, intelligent planning, and informed judgment.

UNIT CONTENTS



CHAPTER ◆ 15

BUYING A CAR

Purchasing a car requires mature judgment, evaluation of needs, and ability to manage expense. It is important to learn how to assess safety features, fuel efficiency, comfortability, and insurance needs to make a wise choice.