



## chapter 12

# DRIVING IN ADVERSE CONDITIONS

12.1 Reduced Visibility

12.2 Reduced Traction

12.3 Other Adverse Weather Conditions

### KEY IDEA

What can you do to manage the effects of hazardous weather on your visibility and your vehicle's traction?



### YOU'RE THE DRIVER

Driving in hazardous weather, such as blizzards, heavy thunderstorms, or even rain and fog, requires special skills. The unpredictable nature of drivers in such conditions adds to the driving risk. How can you control your vehicle despite the environmental conditions you'll be driving in?



# Lesson 12.1

## REDUCED VISIBILITY

### OBJECTIVES

How to use the process to manage situations of poor visibility. What you can help others see at dawn and dusk. The special uses you can use in driving. The procedure at night when entering an area. The driver who uses low-beam headlights.

### GLOSSARY

Driving headlights

1. Windshield wipers be able to clean the windshield. **Identify** How would you manage risk in this situation?



Whenever visibility is reduced, drivers need more time to use the IPDE Process and apply Zone Control driving techniques. You can maintain a safe intended path of travel by slowing down to give yourself more time; by scanning in and around your path of travel to the target area; by predicting others will maneuver into your intended path of travel; by deciding to position your vehicle ahead of time with an extra space cushion around it; and by executing driving actions gently to maintain control so others know what you are doing.

### Dirty Windows

It's important to keep your windows clean because dirty windows will reduce your visibility. A simple thing like moisture forming on the inside of your windshield can make the difference between safe, low-risk driving and colliding with another vehicle. When the slightest amount of moisture builds up, turn on your front-window defroster, switch on your rear defogger, or use the air conditioner or heater if it will help. You can always open windows as needed.

Clean all windows and lights ahead of time in bad weather. Keep a



close check on any ice, snow, or dirt buildup, especially on headlights and taillights. Stop to clear them by hand.

Even in good weather, clean windows can be a problem. The plastics used in many vehicle interiors can give off vapors that coat the inside of windows over time. Cigarette smoke can create a dirty-window problem as well. By keeping windows clear, you improve your ability to identify, especially at night.

### Sun Glare

At times the sun can create severe and blinding glare conditions. Sunglasses and a sun visor can help, but try to avoid looking toward the sun.

By driving with low-beam headlights on all the time, you help other drivers see you. The brightest day will create the darkest shadows. With severe-glare situations and the sun behind you, be prepared for other drivers to miss seeing your signal or even seeing your vehicle.

### Low Levels of Light

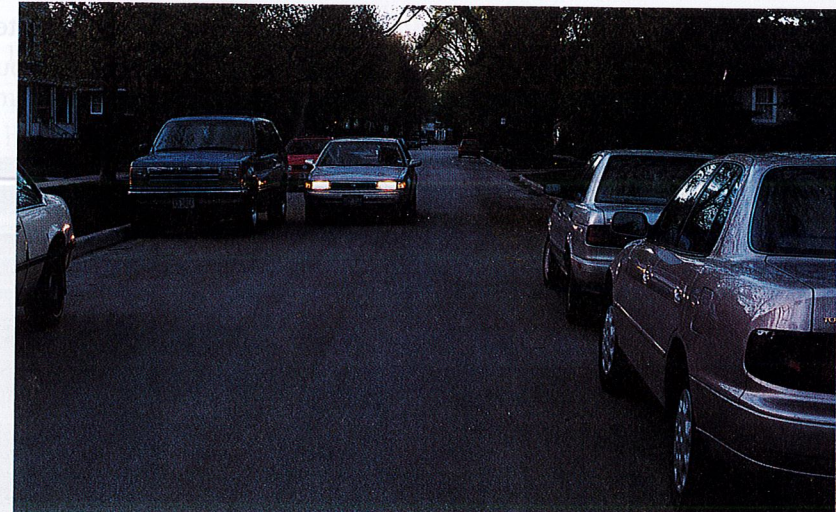
Low levels of light at night severely limit your ability to use the IPDE Process. Dawn- and dusk-driving situations can also be very dangerous. The low visual contrast between moving vehicles and the driving scene can be deceiving. Again, by always driving with your headlights on low beam, you can help others to see you.

**Headlights** Keep these points in mind when driving with your headlights on at night:

- Use high-beam headlights to see further down the road. Also, look beyond your headlights for important information. Only use your high-beam headlights when vehicles are more than one-half mile in front of you.

**FIGURE 2**

Driving at dawn without headlights can set many traps. **Identify** How would you manage risk if the oncoming driver did not have headlights on?





Switch to low-beam headlights the instant you see the headlights of an oncoming vehicle, the taillights of a vehicle you are approaching, or the taillights of a vehicle that has just passed you. This prevents you from blinding the other driver with your headlights.

- Use low-beam lights in bad weather. In snow, heavy rain, or fog, high-beam headlights will reflect more light back into your eyes; as a result, you will see less.

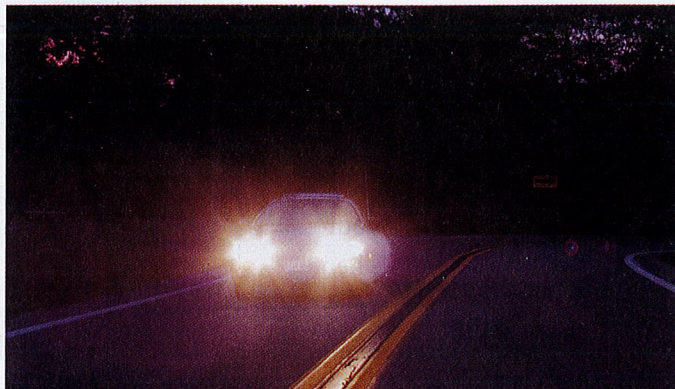
**Meeting Other Vehicles** If an oncoming driver has high-beam headlights on, take the appropriate action based on the following questions:

1. Is the oncoming driver far enough away to respond to you? Briefly flick your headlights from low to high to low to remind the oncoming driver to switch to low-beam headlights. Most new vehicles make this easy by having a flash-to-pass position on their high-beam control switch.
2. Is the oncoming driver closer, and still using high-beam headlights? Slow down, move to lane position 3, and glance at the right edge of the road.
3. Could you be blinded by bright oncoming headlights? Look ahead with frequent quick glances to check oncoming traffic. Do not stare directly into oncoming high-beam headlights.
4. Is it possible you will encounter a hazard to the right after the oncoming vehicle? Be ready to adjust to a new situation beyond the oncoming headlights.

**Overdriving Headlights** The term **overdriving headlights** means driving at a speed that makes your stopping distance longer than the

**FIGURE 3**

The oncoming car has its high-beam lights on. **Predict** How might you have to adjust to a new situation beyond the headlights?



distance lighted by your headlights. Make sure you do not overdrive your headlights, especially in bad weather or on a slick road.

In normal driving conditions, use the following steps, known as the 4-second stopping-distance rule, to see if you are driving within the range of your headlights.

1. Pick a fixed checkpoint ahead the instant the checkpoint appears in the area lit by your headlights, as shown **FIGURE 4**.
2. Count off four seconds: “one-thousand-one, one-thousand-two, one-thousand-three, one-thousand-four.”
3. Check your vehicle’s position. When you have just reached your fixed checkpoint, you can assume your stopping distance on dry pavement is within the range of your headlights.

## Visibility and Weather

Adverse weather can increase the risk of being unable to see your surroundings and be seen by other drivers. The best way to reduce the level of risk is to postpone driving until the weather clears. If you must drive in fog, rain, or snow, remember that with reduced visibility comes an increased level of risk.

**Fog** When your headlights shine into fog, light is reflected back by water particles in the air, making it harder for you to see. If you use high-beam headlights, your ability to see is reduced even further. Always use low-beam headlights in fog, as shown in **FIGURE 5**.

Fog also reduces your ability to judge distances. Oncoming vehicles may be closer than you think. Avoid trouble by slowing and increasing the space cushion around your vehicle.

Thick fog, even heavy industrial smoke, can be very dangerous. Before entering fog or heavy smoke, be prepared to slow or park safely off the side of the road.

**FIGURE 4**

The stop sign is five seconds away. **Decide** Are you overdriving your headlights?



**FIGURE 5**

In fog, other vehicles may be closer than you perceive.





If you stop at the side of the roadway, use your hazard lights to warn others that you are stopped. To be even safer, park in a rest area or parking lot.

**Rain** Heavy rain reduces your ability to see and be seen. Keep your windshield clear by using your wipers and your defroster on if your windows fog. Make sure your low-beam headlights are on, as shown in **FIGURE 6**.

Many states require low-beam headlights to be on, when wipers are on. Reduce your speed. If the rain is so heavy that you cannot see well, be prepared to pull off the road and sit out the storm in a safe location, using your hazard flashers.

**Snow** Wind-driven snow can reduce your vision, cover roadway markings, and make steering more difficult. Be prepared to slow and steer carefully. Heavy snow can block your rear window, reducing visibility. Slush or ice also can build up on your windshield wipers. If snow, slush, or ice build up, pull off the roadway and clean it off. Also, clear your headlights, taillights, and other parts of your vehicle as needed.

Use low-beam headlights when it snows, day or night. Reduce your speed to maintain control and to give others time to respond to you. If snow covers the road, closing your right-front zone, do not crowd the center of



Just like fog, rain reduces your ability to see and be seen. **Apply Concepts** How would you reduce your risk if you are a driver?

the road by moving to lane position 2. This action has the effect of narrowing the road and could lead to a head-on collision.

Of course the best way to stay safe is to try to delay travel until roads and weather improve.



**FIGURE 7** Blizzard conditions reduce visibility. **Execute** What special actions would you need to take in this situation?

## review it 12.1

1. What actions should you take when using the IPDE Process in limited-visibility situations?
2. What steps can you take to help others see you at dawn and dusk?
3. When should you use low-beam headlights at night?
4. What should you do if an oncoming driver fails to use low-beam headlights?

### Critical Thinking

5. **Apply Concepts** How would you try to alert an oncoming driver to turn on the headlights?

6. **Relate Cause and Effect** Why are high-beam headlights not as effective as low-beam headlights in increasing a driver's visibility in fog or snowy conditions?

#### IN THE PASSENGER SEAT

**Turn on Those Lights!** How common is it for drivers in your community to have their headlights off in reduced-lighting situations? When riding as a passenger during times of reduced lighting, keep track of how many drivers do not have their headlights on when they should. Keep records for at least five different days and report your findings to the class.





# Lesson 12.2 Reduced Traction

## OBJECTIVES

- be what happens during rain
- know how to correct a skid
- know how to use controlled-braking

## VOYABULARY

- planing
- steering situation
- controlled braking

## FIGURE 8

standing water  
risk to drivers.  
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Traction allows your tires to grip the road so that you can control your vehicle. Rain, snow, ice, sand, and other materials can limit your traction. Reduced traction can create high-risk driving situations.

## Wet Roadways

Rain-slick roads can create a problem for any driver. You can avoid trouble by knowing the right actions to take ahead of time.

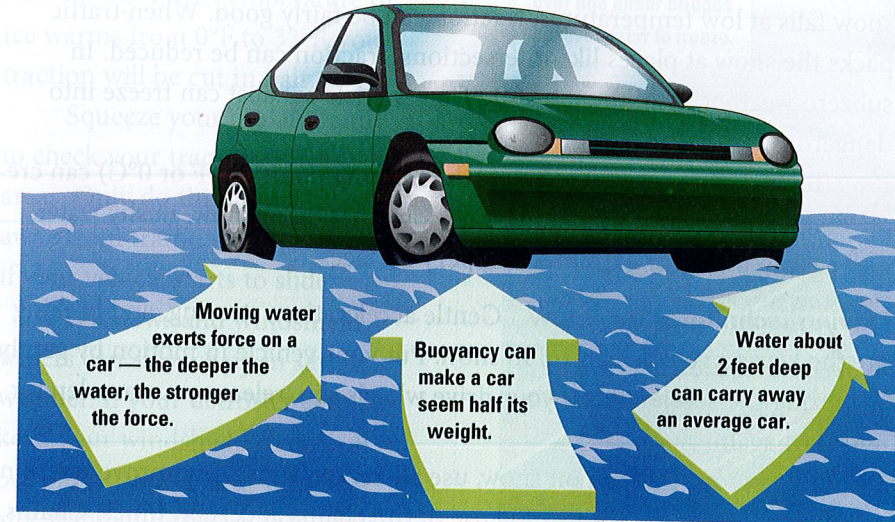
**Rain** When rain starts to fall, it mixes with dust and oil on the road. This mix can make the road very slippery, until more rain washes the mixture away.

Any amount of rain will reduce the traction needed to start, stop, and steer the vehicle. Reduce speed to make better use of limited traction on wet roads.

**Hydroplaning** When a tire loses road contact by rising up on top of water and no longer has contact with the road, **hydroplaning** occurs. Hydroplaning is caused by a combination of standing water, speed, and tire condition. The deep tread of new, properly inflated tires will cut through the water and grip the road. But even with good tires, hydroplaning can occur at speeds of 35 mph, in water as little as 1/12-inch deep. Tires that are bald or under inflated can start to lose their grip and hydroplane at less than 35 mph. Slushy snow in standing water also increases the risk of hydroplaning.



**FIGURE 9**  
Deep water can be dangerous.



Moving water exerts force on a car — the deeper the water, the stronger the force.

Buoyancy can make a car seem half its weight.

Water about 2 feet deep can carry away an average car.

If you must drive through standing water, reduce speed and use properly inflated tires with good tread to avoid hydroplaning.

**Deep Water** If you don't know the depth of the water ahead, do not drive through it. If you must drive through deep water, use the following steps:

1. Estimate water depth by watching other vehicles and looking at objects such as fire hydrants, fence posts, and parked vehicles. **If there is even a slight possibility of the water coming up to the bottom of your vehicle, do not enter the water.**
2. If the water is just over the rims of your tires, drive slowly in low gear. Avoid driving on a soft shoulder. Try to drive on the higher center of the road.
3. When driving at a low speed through water, apply a light brake pressure with your left foot to build friction and create heat on your brake pads. This heat will help dry your brakes and keep them working.
4. After leaving the water, squeeze your brake pedal lightly to see if your brakes are working normally. If your vehicle pulls to one side or does not slow, drive for a short distance while applying a light brake-pedal pressure with your left foot to help dry your brakes.

## DID YOU KNOW?

Floods cause more deaths than any other weather condition, and 60 percent are vehicle related.





## Snow

Different types of snow can produce different levels of traction. When fresh snow falls at low temperatures, traction can be fairly good. When traffic packs the snow at places like intersections, traction can be reduced. In subzero weather, even the moisture from vehicle exhaust can freeze into dangerous ice on the pavement.

Temperatures at or just below the freezing point (32°F or 0°C) can create dangerous traction situations. The combination of snow, slushy water, and ice can make for extremely slippery surfaces.

**Driving Techniques for Snow** Gentle acceleration, steering, and braking are the keys to vehicle control in snow. Put your vehicle in motion by gently squeezing the accelerator. If your drive wheels slip, release your accelerator and start again.

To improve traction on snow, use all-season tires. To improve traction even more, many states allow the use of tire chains at certain times. Chains are placed over the tread on the tires to increase traction.

**Rocking** Often you can move your vehicle out of deep snow, mud, or sand by driving forward a little and then back a little. By repeating this sequence, you can work your way out. This technique is called **rocking** a vehicle. Check your owner's manual to make sure this procedure will not hurt your transmission. If it is okay, follow these steps:

1. Straighten your front wheels as the driver in **FIGURE 10** has done.
2. Gently accelerate forward. Do not spin your wheels.
3. Let up on your accelerator. Pause just long enough to let the engine slow. Shift to REVERSE and gently move backwards. Let up on your accelerator and shift to DRIVE to move forward.
4. Continue this back-and-forth movement until your vehicle has cleared tracks that are long enough to drive out.

Why are gentle control actions to rock your vehicle?



## Ice

Be especially alert if temperatures drop below freezing and it is raining. These conditions are just right for snow, ice, and sleet. Predict the worst when ice begins to form.

Temperatures will change the amount of traction you will have on ice. If the temperature of ice warms from 0°F to 32°F, your traction will be cut in half.

Squeeze your brakes lightly to check your traction in icy areas. Only do this at low speeds away from traffic. Slow gradually if your vehicle starts to slide.

Windows and windshield wipers can also ice up in severe weather. If your defroster cannot keep your windshield clear, pull out of traffic and clear it manually. It might be best not to drive at all.

If you must drive, be extra alert for these icy situations:

**Ice on Bridges** Bridge roadways tend to freeze before other roadway surfaces. Cold air circulates above and below the roadway on bridges and overpasses, as shown in **FIGURE 11**.

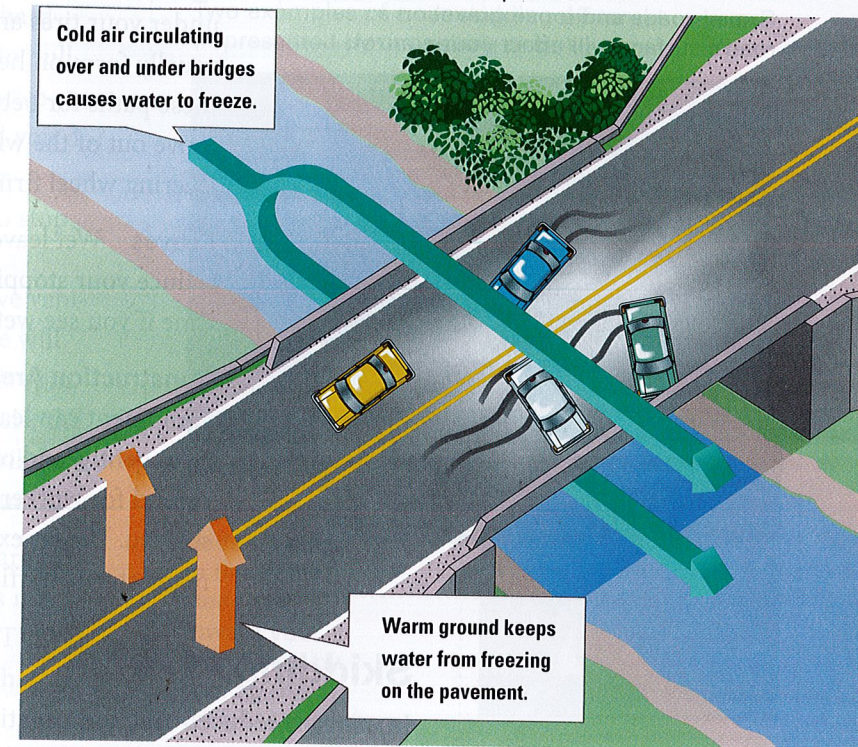
**Black Ice** Be alert for “black ice” that forms in thin sheets, which can be extremely hard to see. Be extra careful for this type of ice in winter mountain situations.

**Ice in Tire Tracks** Snow can pack down into ice in the normal driving tracks, especially at intersections. Avoid these slippery tracks by moving a little to the right in lane position 3 to use the unpacked, less-slick portion of your lane.

## Other Reduced-Traction Situations

Braking distance will always increase in low-traction situations. Slow early and then be ready to slow even more.

**FIGURE 11** Ice forms on bridges and overpasses first.





roads and loose gravel on a road surface will affect your control.



**Gravel Roads** Loose gravel on roads can act like marbles under your tires and cause skids. Well-packed wheel paths usually form on heavily traveled gravel roads. Drive in these paths for better traction and control. If you need to move out of the wheel paths, slow down, and hold your steering wheel firmly.

**Leaves** Wet leaves on the road can decrease traction and reduce your stopping and steering control. Slow ahead of time if you see wet leaves on the pavement.

**Construction Areas** Construction trucks and other equipment can leave mud, dirt, or sand on the road. Slow, steer gently, and obey workers' directions. Be especially careful for workers and construction drivers who do not see you. Use an extra space cushion to protect them. In many states, traffic fines double in construction zones.

## Skidding

In extreme reduced-traction situations, your tires may lose all or part of their grip on the road and **skid**. Skidding can happen on any surface while you are braking, accelerating, or steering.

In addition to slowing ahead of time, early detection is one of your best defenses to control skidding. Look ahead to see your target well down the road. The instant you see your vehicle is not traveling in your intended path of travel toward your target, you need to start correcting the skid. If you wait until you feel your vehicle skidding, you may not be able to correct the skid in time to avoid trouble.

**Loss of Traction** If you know and can execute the correct response when your tires lose traction and you start to skid, you will be able to control the situation more quickly. In all loss-of-traction situations, remember that a locked or spinning wheel provides no traction or steering control. Keep applying the correct driver inputs and responses and don't give up trying to correct a skid.

Construction zones can create hazardous roadway conditions. What are some factors that affect your traction in a construction area?



**Loss of Traction to Power Wheels** You are at a stop sign and the road is slippery with hard packed snow and ice. As you accelerate to pull away from your stopped position, you notice your power wheels are spinning. What should you do?

In this situation, simply release your accelerator and allow the spinning tires to stop spinning and regain traction.

If you are driving a front-wheel-drive vehicle and apply too much power, the vehicle will likely just sit there while your front wheels spin. If you are driving a rear-wheel-drive vehicle, the rear wheels will slip and spin, and there will be a slight tendency for the rear end to slide out.

**Loss of Traction to Front Wheels** You are in a residential area and turning. Your car is not turning as quickly as you want it to turn. The front wheels are sliding straight ahead. What should you do?

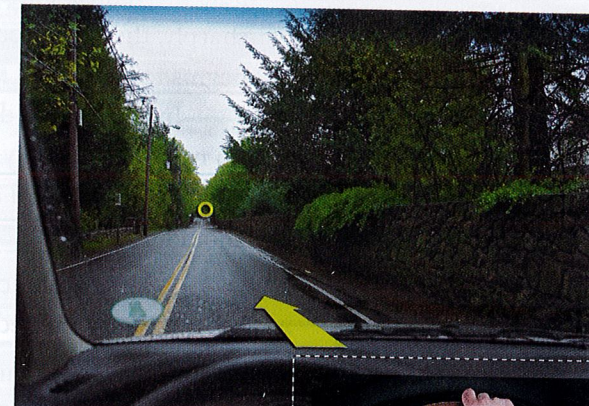
In this situation, your front wheels do not have enough traction for your vehicle to turn as it should. This is known as an **understeer situation**.

To correct the loss of traction, ease off the accelerator. By doing so you allow more weight to the front, which should help provide more traction to your front wheels. In order for the vehicle to respond to your steering, the front wheels need to have traction.

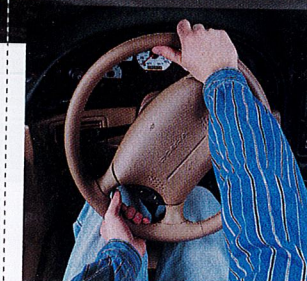
**Loss of Traction to Rear Wheels** Imagine you're driving at 50 mph when a dog suddenly runs into your lane. You brake hard, turn the wheel, and feel your rear end sliding out. This is known as an **oversteer situation**, a skid situation in which a vehicle's rear end tends to slip out or **fishtail**.

FIGURE 14

Two examples of a car skidding off target (represented by the yellow circle).



If your vehicle skids off target to the right, steer back toward your target area by turning the wheel to the left.

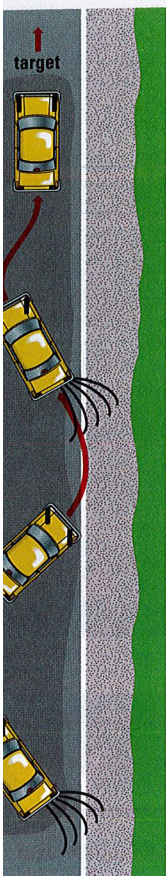


If your vehicle skids off target to the left, steer back toward your target area by turning the wheel to the right.





ing a  
g skid



In this situation, when you hit the brakes a transfer of weight suddenly occurs. Weight is moved from the rear wheels and shifted to the front. This puts the vehicle out of balance. Then, when you turn the steering wheel sharply, the out-of-balance vehicle starts to go out of control, as the rear end begins to slide out.

In rear-wheel-drive vehicles when an oversteer situation occurs, you do not want to apply more power to the sliding wheels. Antilock braking and stability control systems help minimize fishtailing. Here are actions you should take:

1. Release your accelerator or brake. With manual transmission, depress your clutch pedal.
2. Steer quickly and precisely in the direction your vehicle needs to go, as shown in **FIGURE 14**. On a straight road, steer for your target and intended path of travel. Be careful not to overcorrect for the skid by steering too much.
3. The rear end of your vehicle probably will continue to fishtail after you have corrected the initial skid. Steer and countersteer in the direction your vehicle needs to go. As your speed drops, your control will increase. Look at **FIGURE 15** to see how you can provide precise, smooth, continuous steering actions to correct a fishtail.

A key to avoiding oversteer situations is maintaining your vehicle's balance. If you feel the rear end slide out, let up on the gas pedal, focus on your target area, and steer toward that target down your intended path of travel.

Keep in mind that although rear-wheel-drive vehicles have a tendency to oversteer, and front-wheel-drive vehicles tend to understeer, each type of vehicles can experience both conditions.

## Controlled Braking

Too much braking in a panic stop can lock your wheels, causing a skid and loss of steering control.

Use **controlled braking** to reduce your speed as quickly as possible while maintaining steering control of your vehicle. Controlled braking is a technique of applying your brakes to slow or stop quickly without locking your wheels. Follow these steps to use controlled braking.

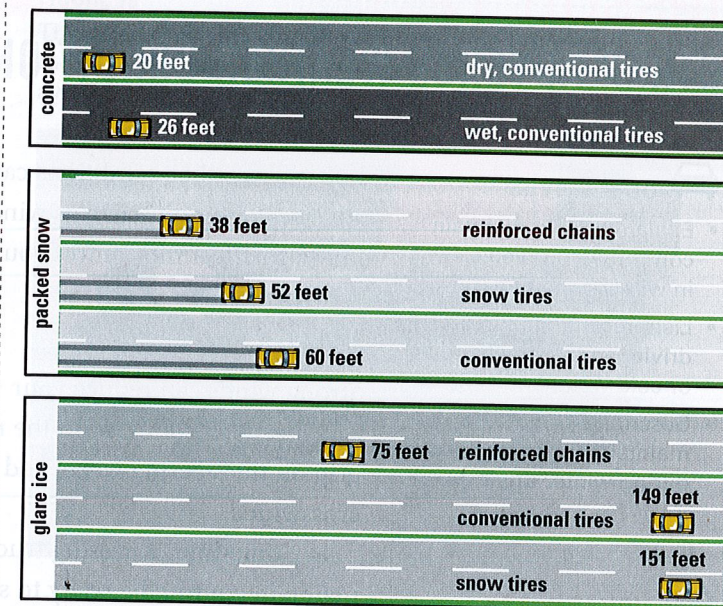
1. With the heel of your foot on the floor, let the ball of your foot press your brake pedal. You must press hard enough to slow your vehicle rapidly without locking your wheels.

2. If your wheels lock and your vehicle skids, ease up on your brake pedal just enough to let your wheels start rolling.
3. Keep using this squeeze-relax a little-squeeze process until you stop.

Using just the right amount of pressure is the hardest part in controlled braking situations. To overcome this problem, most new vehicles are equipped with an antilock braking system (ABS). An ABS-equipped vehicle uses a computer to prevent its wheels from locking—even in an emergency stop. If your vehicle has an ABS, just press the brake pedal as hard as you can in an emergency. You may feel little pulses through the brake pedal or hear the ABS at work. Don't let up on the brake pedal; maintain firm pressure until you stop. Also remember, ABS vehicles will allow you to steer and brake at the same time. *They will not enable you to stop in a shorter distance.*

**FIGURE 16** shows how far a typical vehicle travels before stopping when braking at a speed of 20 mph. Notice the difference that different tires and road surfaces can make.

**FIGURE 16 BRAKING DISTANCES AT 20 MPH**



## review it 12.2

1. How do rain and snow affect a vehicle's traction?
2. How does hydroplaning affect vehicle control?
3. How do you know if you are experiencing an understeer situation?
4. How can a driver attain maximum controlled braking in a vehicle that is not equipped with ABS?

### Critical Thinking

5. **Relate Cause and Effect** Explain why tires with poor or little tread can cause a vehicle to be less fuel efficient.

6. **Apply Concepts** Explain why front-wheel-drive vehicles are less likely to experience situations in which the rear end slides out.

### IN YOUR COMMUNITY

**On the Skids** Identify a busy intersection in your community and observe traffic after a fresh snow or rainstorm. Watch vehicles approaching the intersection and identify how many vehicles were able to stop without skidding and how many experienced a skid situation when attempting to stop. Report your findings to your class.





# Lesson 12.3

## OTHER ADVERSE WEATHER CONDITIONS

### OBJECTIVES

How to maintain control of your vehicle in adverse weather conditions.  
 Precautions for driving in extremely hot or cold weather.  
 What to do to maintain vehicle control in winter driving.

### VOCABULARY

Exhaust pipe

Extreme weather conditions can make routine driving very difficult. Other adverse conditions such as wind, extreme temperatures, and winter weather may also affect the control you have while driving.

### Wind

Strong winds can reduce your vehicle control and push lightweight vehicles out of the lane or even off the road. Just remember to keep a balanced grip on the steering wheel and be ready to make steering corrections for crosswinds.

Sometimes a passing truck can produce a strong blast of wind. To maintain control, be ready to slow a little, move to lane position 3, and apply extra steering to the left just to keep moving in your intended path of travel.

In the unlikely event you are in an area where tornadoes are spotted, be ready to act. The last place you want to be in a tornado is in a car. If you see a tornado, stop, get out of your vehicle, and lay down in a ditch or under a bridge.

### Hot Weather

Your vehicle is designed to operate in a wide range of temperatures. It has a cooling system to help it warm up in winter and stay cool in the summer. But in extreme conditions, problems can develop.

Your temperature light or gauge indicates when your engine is too hot. When this happens, turn off your air conditioner. It may be uncomfortable, but you might also be able to cool your engine by turning on your

On a very windy day and the wind is moving from your left to right. What should you expect to occur once the truck on the left has completely passed you?



heater. If the engine temperature warning light stays on, stop and park in a safe place to let the engine cool. Once cool, check the coolant level in your cooling-system surge tank. Never remove the radiator cap on a hot engine because the hot liquid inside can scald you. If needed, refill and repair your cooling system.

### Cold Weather

Very cold weather creates problems for vehicles.

#### Be Alert for Exhaust Leaks

Carbon monoxide gas is created when your engine runs. This gas is colorless, odorless, and deadly. Even a small exhaust leak can be dangerous. When driving, always have a source of fresh air coming into your vehicle—even if you have to open a window a little. If you are stuck in snow with your engine running, make sure your **exhaust pipe**, or tailpipe, is not blocked, as the woman in **FIGURE 18** is doing.

**Do Not Race a Cold Engine** Racing a cold engine will increase wear on it. Do not run a cold engine at high speeds.

**Do Not Set Your Parking Brake** Ice or slush stuck to the underside of your vehicle can freeze your parking brake when you park your vehicle. In these conditions, use your automatic transmission PARK gear, or the REVERSE gear with a standard transmission.

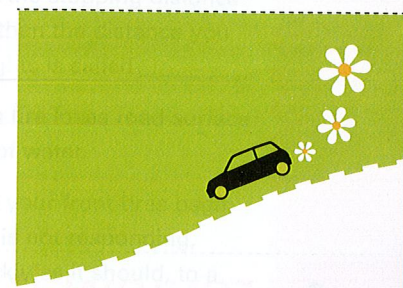
### Tips for Smooth Winter Driving

Winter driving will test the best of your IPDE driving skills. The extra effort you make to maintain an adequate line of sight is worth it. The following tips will help make winter driving a smooth process:

**Look and Listen for Traffic Reports** Be alert to television and radio reports about collisions, road repairs, and bad weather. You also can take advantage of Internet sources.

FIGURE 18

The woman is checking the exhaust pipe before she gets in the car. **Analyze** Why is it a good idea to clear deep snow away from your tailpipe?

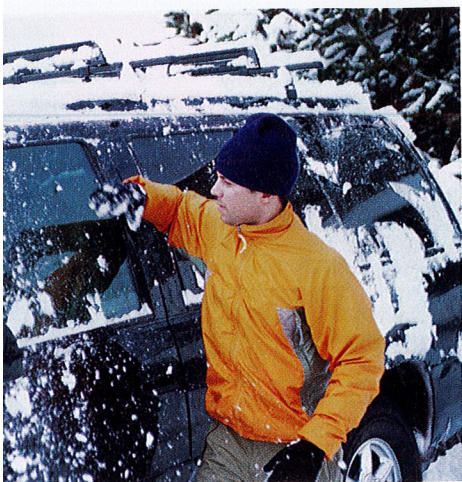


drive green

**Idling** When warming your vehicle in cold weather, avoid excessive idling. Excessive idling can overheat a vehicle's engine, waste fuel, and add air pollution.



Clear your windows, roof, hood, trunk, and taillights of snow and ice.



**Keep Windows Clear** Remove snow and ice before driving as the driver in **FIGURE 19** is doing. Don't forget to clean your headlights and taillights. You want to see and be seen; you do not want snow to blow off and block your vision or become a hazard to vehicles behind you.

**Respect Lower Speeds** Travel with the flow of traffic, but always maintain control of your vehicle.

**Keep a Safe Following Distance** Allow six, seven, or more seconds of following distance just to make sure you have room.

**Try to Keep Moving in Snow** If you must be out in a blizzard, be alert for drivers who are stalled, disabled, or moving extremely slowly. Try to avoid getting stuck behind them. Slow down and maneuver to avoid others and to keep moving.

The energy of motion created by your moving vehicle can help carry you through snowy situations.

**Use a Lower Gear on Slippery Roads** Use a lower gear to maintain control on ice or snow. Remember to keep moving to avoid getting stuck.

**Avoid Cruise Control** Do not use cruise control on slippery roads. The system could cause you to lose control.

## view it 12.3

What actions must you take to maintain vehicle control in strong winds?

What can you do to cool an overheated engine?

Why should you try to keep moving at low speeds in heavy snow?

### al Thinking

**elate Cause and Effect** Explain why driving under an overpass in extremely windy conditions can affect vehicle control.

5. **Predict** You're on an interstate and following a large semi-tractor trailer with a lot of snow on top of its trailer. What potential hazard might this pose to you? What could you do to minimize risk in a situation like this?

#### IN THE PASSENGER SEAT

**Losing Traction** Your friend is driving to school when it starts to snow heavily. Because you're late for class, she begins to speed up and starts to skid. What would you say to your friend to help her control the skid?

# CHAPTER 12 REVIEW

## Lesson Summaries

### 12.1 REDUCED VISIBILITY

- When visibility is poor, slow down, allow extra space, and actively scan and search.
- Proper use of high- and low-beam headlights helps drivers see better and prevents blinding—or being blinded by—oncoming drivers.
- Driving with your headlights on helps others see you, especially at dawn and dusk.

### 12.2 REDUCED TRACTION

- Whenever the road surface is wet or snow-covered, traction is reduced.
- When a vehicle's tires rise on top of standing water, the tires lose traction and the vehicle does not respond to steering.
- Understeer and oversteer conditions, if not quickly corrected, can put a vehicle out of control.

### 12.3 OTHER ADVERSE WEATHER CONDITIONS

- Strong side winds can cause your vehicle to shift lane positions. Driving in windy conditions requires constant steering corrections to maintain lane position.
- Extreme temperatures place demands on vehicles' heating and cooling systems, and often cause vehicles to overheat.
- Snow can adversely affect a driver's vision and a vehicle's traction.
- Greater vehicle control can be maintained on snow- and ice-covered roads by accelerating, steering, and braking gradually and gently.

## Chapter Vocabulary

- controlled braking
- exhaust pipe
- fishtail
- hydroplaning
- overdriving headlights
- oversteer situation
- rocking
- skid
- understeer situation

Write the word or phrase from the list above that completes the sentence correctly.

1. A(n) \_\_\_\_\_ results when a vehicle loses part or all of its grip on the road.
2. \_\_\_\_\_ is a technique that can be applied when trying to move your vehicle out of deep snow.
3. The action of a vehicle's rear end sliding out to a side is called a(n) \_\_\_\_\_.
4. \_\_\_\_\_ is a technique of reducing your speed as quickly as possible while maintaining control of your vehicle.
5. Driving at a speed where the stopping distance of your vehicle is longer than the distance you can see with your headlights is called \_\_\_\_\_.
6. \_\_\_\_\_ occurs when a tire loses road surface contact and rises on top of water.
7. It is a(n) \_\_\_\_\_ when your front tires begin to plow and your vehicle is not responding, or not responding as quickly as it should, to a steering input.



#### STUDY TIP

**Make a Poster** Draw a diagram illustrating an understeer situation, along with a description. Your partner will create a similar poster for an oversteer situation. Share your posters and discuss the accuracy of both the drawings and the descriptions.