





CHAPTER 8

Starting, Steering, Stopping

Basic driving procedures are second nature to good drivers. It is important that you learn these procedures so that you can manage them safely and smoothly. Mastering the basics is crucial to the driving task.

LESSON ONE

Basic Operating Procedures:
Automatic Transmission

LESSON TWO

Basic Operating Procedures:
Manual Transmission

LESSON THREE

Acceleration, Deceleration, and Speed

LESSON FOUR

Learning How to Steer the Vehicle

OBJECTIVES

1. Describe how to start a vehicle with an automatic transmission and how to put the vehicle in motion.
2. Describe how to slow and stop a vehicle with an automatic transmission.

KEY TERMS

transmission
 idle
 threshold braking
 antilock brake system (ABS)

◆ When you follow the steps for starting your car, warning lights come on briefly.

Basic Operating Procedures: Automatic Transmission

In Chapter 1, you learned a basic principle of responsible driving: To reduce risk, you need to manage visibility, time, and space. Your ability to put this principle into practice depends on how well you can control your vehicle. You control a vehicle through a set of gears called a **transmission**. The transmission enables you to move your vehicle forward or backward. The gear you select determines the **direction**.

Whether you drive a vehicle with an automatic transmission or one with a manual transmission, the key to becoming a skilled driver is the same: *practice*.

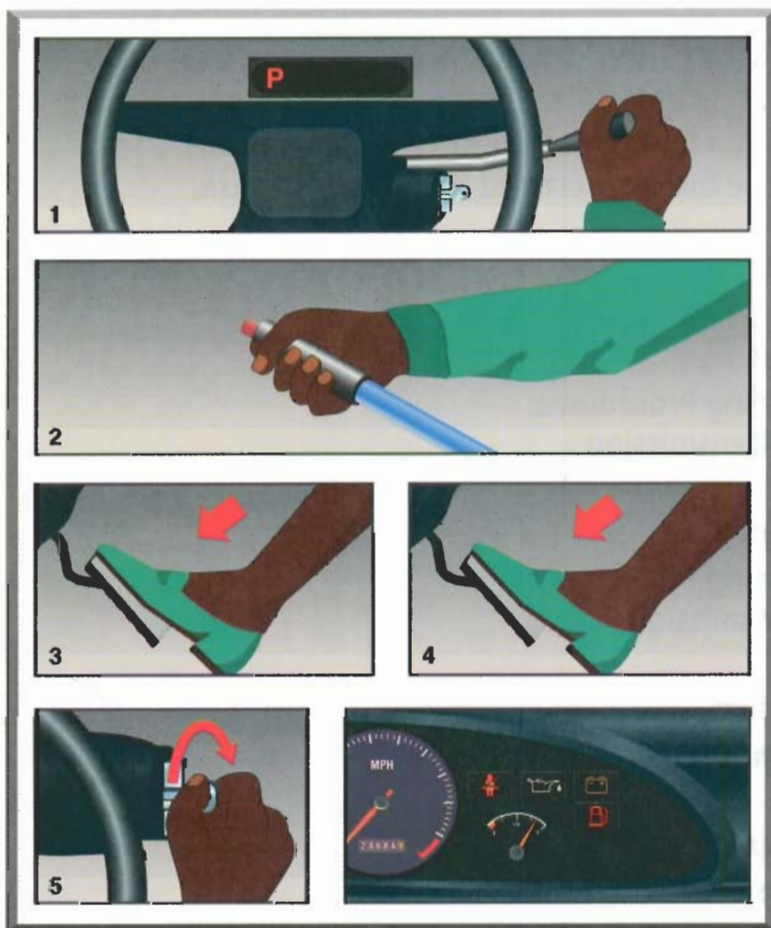
How Do You Start and Move a Vehicle with an Automatic Transmission?

It is important to start your vehicle's engine properly to avoid damaging the starter system or wasting fuel.

To start the engine of a vehicle with an automatic transmission, follow the steps below, one at a time. Practice doing these steps until they become habit.

1. Make sure the gear selector lever is in Park. If the selector lever is in Neutral, the car may roll if the parking brake has not been set.
2. Check that the parking brake is set.

Note: If your car has an electronic fuel-injection (EFI) system or if the engine is warm from driving or very



cold from the weather, Steps 3 and 4 may vary or may not be required at all. Check your vehicle's owner's manual for details.

3. Set the automatic choke by pressing the accelerator (gas pedal) once to the floor and releasing it.
4. Press the accelerator lightly with your right foot and hold it.
5. Turn the ignition key to the Start position. Release the key *as soon as* the engine starts.
6. As the engine **idles** (runs with no pressure on the accelerator), check the gauges and warning lights to be sure that the oil-pressure system and other systems are working properly.

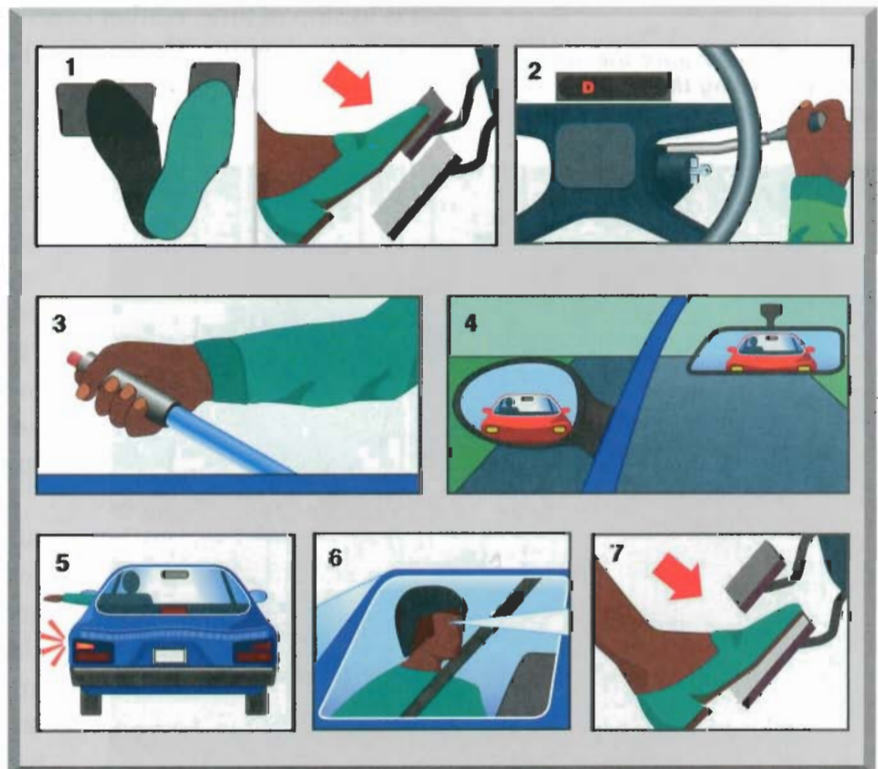
Putting the Vehicle in Motion

Once your engine is running and you've checked the gauges, you're ready to put the vehicle in motion. Follow these steps.

1. Press down firmly on the brake pedal. Follow the advice of your driving instructor about which foot to use when braking.
2. Use your right hand to shift the gear selector lever to Drive or Reverse, depending on which way you intend to move.
3. Release the parking brake.
4. Check for traffic in your rearview and sideview mirrors. Be prepared to accelerate into the desired lane once the roadway is clear.
5. Turn on your directional signal to indicate the direction in which you want to move.
6. Look over your shoulder to check blind spots.
7. Remove your foot from the brake, and gradually apply pressure to the accelerator.

Working the accelerator properly takes practice if you use your right foot for both accelerating and braking. For best control of both the accelerator and brake pedals, rest the heel of your right foot on the floor in a position that lets you keep it there while

♦ *To put a car in motion, accelerate gently to avoid "jackrabbit" starts.*



Energy Tips

Allowing your engine to run unnecessarily while your vehicle is stopped or parked wastes fuel and pollutes the air. In some cities, doing so is also against the law.

pivoting back and forth between the two pedals. The forward part of your foot should fall comfortably on both pedals.

Moving forward after stopping on an uphill grade requires extra practice. To keep from rolling back, use your left foot to press the brake pedal while gently accelerating with your right foot. As soon as the vehicle starts to pull forward, take your left foot off the brake. (An alternative is to hold the vehicle in place by setting the parking brake, then releasing the brake as you accelerate.)

How Do You Slow and Stop a Vehicle with Automatic Transmission?

You will often have to slow down and stop your vehicle under both planned and unexpected circumstances. Red lights, stop signs, pedestrians running across streets, vehicles cutting in front of you—these and countless other situations will require you to apply your brakes.

Braking

For smooth braking, you need to develop a sense of timing and get a feel for applying the right amount of pressure on the brake pedal. Your goal is to stop in time, neither overshooting nor undershooting your desired stopping point. Moreover, whenever possible, you want to stop your vehicle gradually, not abruptly.

The amount of foot pressure required to brake to a stop depends on the size and weight of the vehicle, its type of brakes, your maneuvering space, and the road surface. As you practice driving and become more experienced, you'll become increasingly skilled at judging the distance needed to bring your vehicle to a smooth stop.

For effective control of brake pressure, position the heel of your foot between and in front of the accelerator and brake pedal. In this way, you'll be able to apply pressure with your toes, and you can easily increase or decrease pressure as needed. (See illustration on page 135.)

◆ *Identify in advance the need to stop by using the SIPDE process.*



Follow these steps when preparing to brake to a stop.

1. Check your mirrors for any vehicles that may be following. Lightly tap the brake pedal: your flashing brake lights will warn following drivers that you intend to stop.
2. Apply smooth, steady, firm pressure to the brake pedal, easing up slightly as you come to a halt.
3. Leave the transmission in Drive if you plan to move ahead within a minute or so, as when you're stopped for a red light. If you'll be stopped longer, follow the parking procedures described in Chapter 10, and turn off your engine.

Emergency Braking

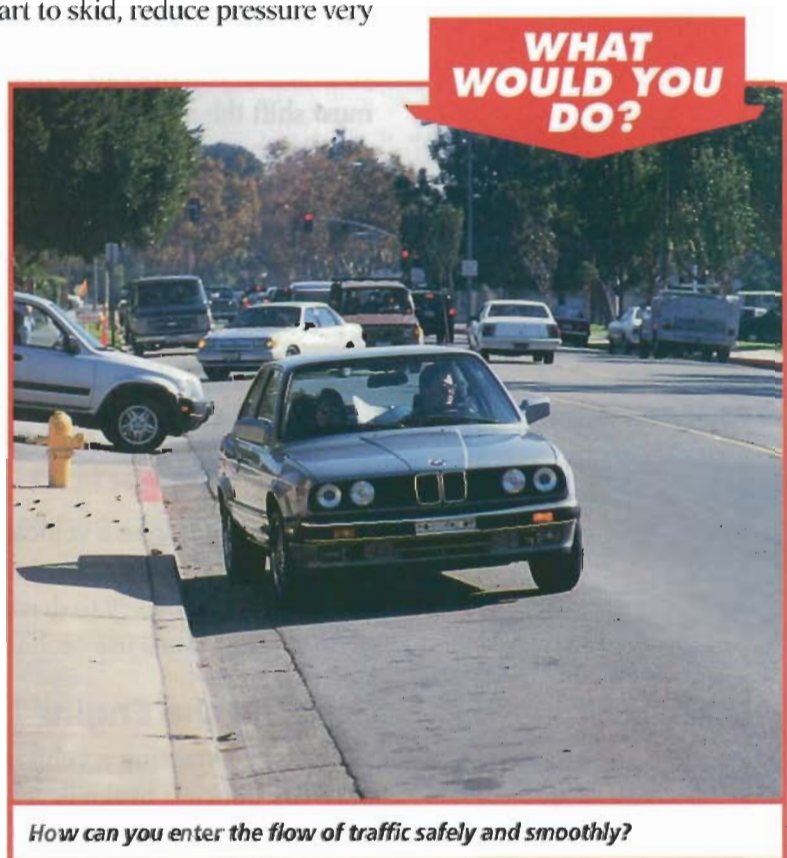
The procedures for stopping under emergency conditions differ slightly. If a driver or pedestrian suddenly enters your path of travel, you may need to stop the vehicle as quickly as possible. However, you don't want to slam on the brakes so hard that the wheels lock (stop turning). Locked wheels can increase your stopping distance and can also cause you to lose steering control and go into a skid.

To prevent the wheels from locking, press, or "squeeze," the brake pedal firmly to a point just *before* the wheels lock, and hold it there. This is called **threshold braking**. If the wheels start to skid, reduce pressure very slightly, then add pressure again as needed. Release pressure as the vehicle comes to a stop. For additional guidelines on braking and skid control, see Chapter 14.

When purchasing a vehicle, consider buying one that has antilock brakes. An **antilock brake system (ABS)** is made to keep the wheels from locking when the driver brakes abruptly.

Lesson 1 Review

1. What steps would you follow to start and move a vehicle with an automatic transmission?
2. How would you use your brakes to slow and stop a vehicle with an automatic transmission? **How** would you stop in an emergency?



OBJECTIVES

1. Explain how manual and automatic transmissions differ.
2. Describe how to start and move a vehicle with a manual transmission.
3. Explain how to use each forward gear.

KEY TERMS

manual shift
clutch
friction point
downshift

Basic Operating Procedures: Manual Transmission

Many people drive vehicles with manual transmissions because they enjoy shifting gears. Others prefer manual transmission vehicles because they usually cost less than the same models with automatic transmissions and, when properly driven, may reduce fuel consumption.

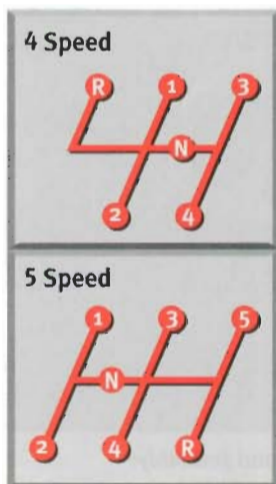
How Do Manual and Automatic Transmissions Differ?

In manual transmissions, there are usually three to five gears in forward and one in reverse. The choice of the forward gear determines the power delivered by the engine to the drive wheels.

An automatic transmission set in Drive will shift the forward gears for you. When you operate a manual transmission, or **manual shift**, you must shift the gears by moving the gearshift (or stick shift) by hand. You start in Low, or **First**, gear and shift to higher gears as you pick up speed. As you slow down, you shift back down from high to low.

To change gears, you **break** the connection between the engine and the transmission by pressing the **clutch** pedal to the floor. When the clutch pedal is up, the engine is again engaged to the transmission.

◆ Below are the gearshift positions for 4-speed and 5-speed manual transmissions.

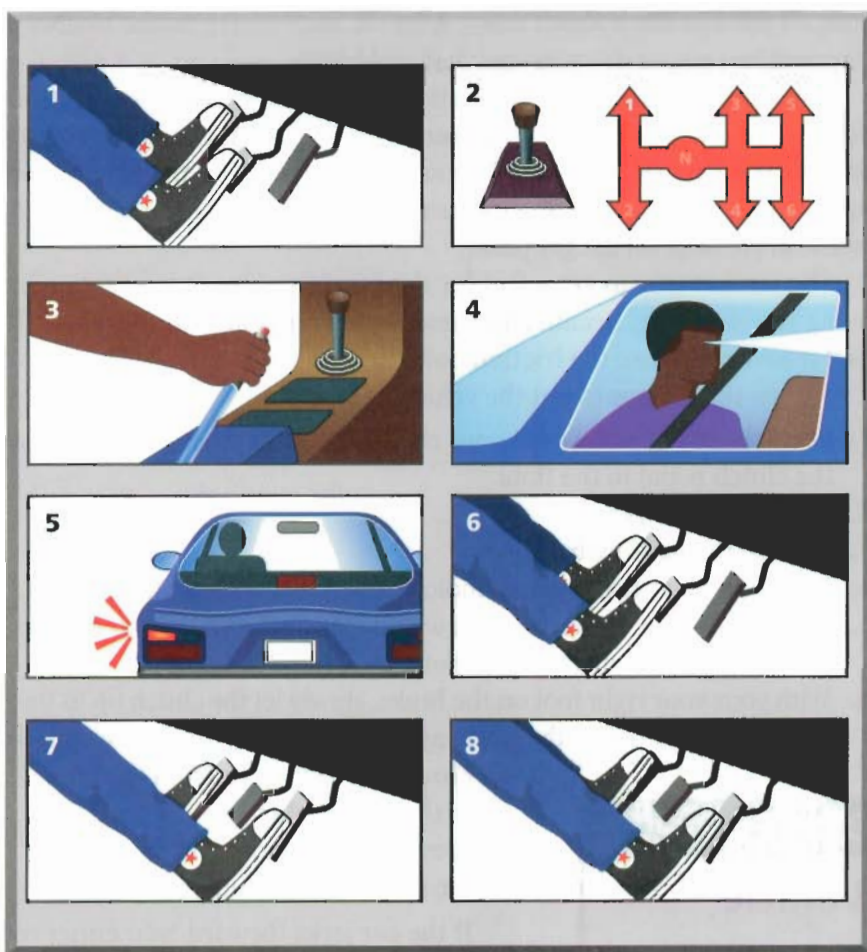


How Do You Operate a Vehicle with a Manual Transmission?

Learning to drive a vehicle equipped with a manual transmission is easier if you already know how to operate a vehicle with an automatic transmission. The key to driving a manual-shift vehicle is mastering the clutch, which you'll use each time you shift gears.

Starting the Engine

As when starting a vehicle with an automatic transmission, make sure the parking brake is set. Press the clutch pedal to the floor with your left foot, press the brake pedal with your right foot, and then shift



◆ You use both feet when you shift and move a car with a manual transmission.

into Neutral. (There is no gear position equivalent to Park on the gearshift for a vehicle with a manual transmission.) Now turn the ignition key to start.

Putting the Vehicle in Motion

To get a manual-shift vehicle to move—and to keep it moving—you must learn to coordinate the use of the clutch with that of the gearshift and the accelerator. Reading about how to do this will help you understand the process. Only through actual practice, however, can you gain the experience needed to master stick-shift driving.

Clutching and shifting actions should come to feel so natural to you that you

◆ It takes plenty of practice to use the clutch pedal to shift smoothly.



scarcely need to think about them. After all, once you're on the roadway, you can't be looking down at your feet and hands.

The key to **smooth clutch** operation is learning to sense the **friction point**. This is the **point when**, as you let up the clutch pedal, the engine and the transmission **engage**. As you continue to let up the clutch, you must match the **forward (or backward)** motion of the vehicle with an increase in pressure **on the gas pedal**.

The easiest way to get a feel for the friction point is to practice by using Reverse gear. Because Reverse is a lower gear than First, you'll find it easier to sense the friction point.

Follow these steps to put the vehicle in motion.

1. Press the brake pedal with your right foot. With your left foot, press the clutch pedal to the floor.
2. Shift into First gear.
3. Release the parking brake.
4. Switch on your turn signal to indicate the direction you plan to move.
5. Check for traffic in your rearview and sideview mirrors. Look over your shoulder to check blind spots.
6. With your right foot on the brake, slowly let the clutch up to the friction point. Look at the roadway, not down at your feet or hands!

7. Move your right foot from the brake to the accelerator.

8. Pressing down gently on the accelerator, slowly let the clutch pedal up.

If the car jerks forward, you either released the clutch too abruptly, or you pressed too hard on the gas pedal. If the vehicle lurches and the engine stalls, you have not fed the engine enough gas. Keep practicing until you can coordinate clutch and accelerator.

How Can You Use Each Forward Gear?

Your selection of **gears depends on the** power and speed you need for various driving tasks.

Low, or First, gear gives the power needed to set a vehicle in motion.

Second gear lets you go as fast as 15 to 25 mph, depending on the horsepower of

TIPS

FOR NEW DRIVERS

Holding the Vehicle in Place

Learning to move a manual-shift vehicle forward after stopping on an uphill grade takes practice. To keep the car from rolling backward, follow these steps.

1. Set the parking brake.
2. Press the clutch to the floor, and shift into First gear.
3. Let the clutch pedal up to the friction point, and press gently on the accelerator.
4. Release the parking brake as you begin to feel the car pulling forward.
5. Press the accelerator as you let up the clutch pedal.
6. Accelerate in First gear until you have gained enough speed to shift into Second gear.

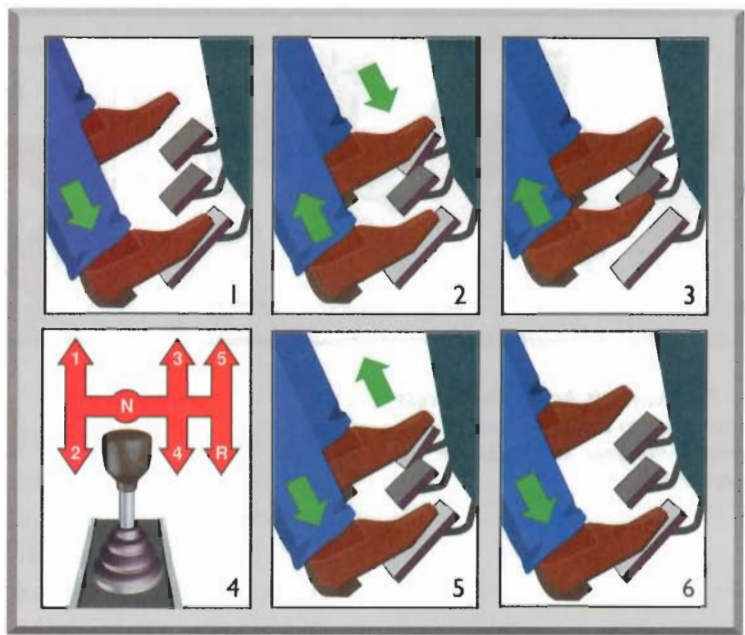
Don't hold your vehicle in place on a hill by pressing the gas pedal slightly while keeping the clutch near the friction point. "Riding the clutch" this way wears your clutch needlessly. Always brake to keep your vehicle from rolling back.

the engine and on whether the transmission is a 3-, 4-, or 5-speed one. You can also use Second gear to start on ice or to drive in heavy snow.

Third gear, in vehicles with 3-speed transmissions, is used for all speeds over 25 mph. If a vehicle has a 4- or 5-speed transmission and a small engine, Third is used at speeds up to 30 or 40 mph.

Use Fourth gear for driving above 35 mph on flat roadway. When you are driving uphill, you may have to achieve 40 mph or more before shifting to Fourth or Fifth gear.

Keep in mind that power, speed, and the gear in use are strictly related. At a given speed, the power of an engine is greater in lower gear. For example, when starting up a steep grade, you generally shift to a lower gear to maintain power. When the roadway levels out, you can shift to a higher gear and keep up the same speed with less power.



◆ **Coordinate** using the clutch, gearshift, and gas pedal to shift gears.

Shifting to a Higher Gear

To shift to a higher gear, follow these steps.

1. Accelerate to a speed appropriate for the gear you want to be in.
2. Press the clutch pedal to the floor.
3. Release the accelerator.
4. Shift to the next higher gear.
5. Press again on the accelerator. Release the clutch pedal slowly through the friction point.
6. Let the clutch pedal up all the way.

Downshifting

There are several reasons to downshift, or shift from a higher to a lower gear: to gain power, to accelerate, to steer effectively, to brake the vehicle on a downslope (except when the road is slippery), and to slow down or stop.

To shift to a lower gear, follow these steps.

1. Release the accelerator. (If you also want to slow down, press the brake pedal.)
2. Press the clutch pedal to the floor.



◆ **To downshift, brake. Then press the clutch to the floor, shift to the next lower gear, and press the accelerator.**

3. Shift to the next lower gear. (Sudden decrease in speed may require **shifting** to an even lower gear—as when braking sharply and downshifting from Fourth gear to Second.)
4. Release the **clutch** pedal to the **friction point**. Press down on the **accelerator** as necessary.

Note that you do not have to downshift through **each lower gear** as you slow down or stop. In fact, routinely downshifting to stop will cause unnecessary wear on the clutch, an expensive part to replace.

It is easy to downshift from Fifth, Fourth, and Third gears to lower gears, but it is difficult to shift from Second to First. To downshift to First gear, you have to bring the vehicle almost to a complete stop.

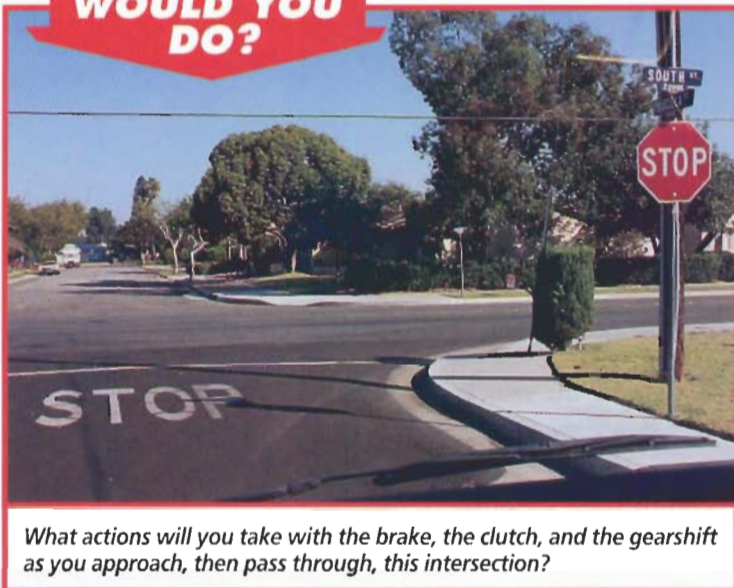
Stopping

To stop from a low gear, follow these steps.

1. Check mirrors for traffic behind you.
2. Tap the brake pedal to flash your brake lights and signal drivers behind you that you intend to stop.
3. Press the brake pedal to reduce speed to 10 to 15 mph. Then press the clutch pedal to the floor to **keep the vehicle** from stalling.
4. Apply smooth, steady brake pressure to bring the vehicle to a stop.
5. Keep your foot on the brake pedal and shift to **Neutral**.

To make an emergency stop, press the clutch pedal to the floor, and use threshold braking.

WHAT WOULD YOU DO?



What actions will you take with the brake, the clutch, and the gearshift as you approach, then pass through, this intersection?

Lesson 2 Review

1. How is a manual transmission different from an automatic transmission?
2. What **steps** would you follow to start and move a vehicle with a manual transmission?
3. How would you use the forward gears of a vehicle that has a manual transmission?

Acceleration, Deceleration, and Speed

To minimize driving risk, you must be able to maneuver your vehicle safely. To do so, you have to know your vehicle's capabilities and limitations. When changing lanes or passing, for example, you need to judge how much time and distance your vehicle will require to move ahead of other vehicles. Learning about acceleration, deceleration, and speed can help you judge time and space more accurately, thus helping you to be a safe driver.

OBJECTIVES

1. Define acceleration and deceleration.
2. Explain how these terms are related to speed.

KEY TERMS

acceleration
rate of acceleration
deceleration
rate of deceleration

How Are Acceleration, Deceleration, and Speed Related?

Speed and acceleration are closely linked. When drivers say their vehicle has good **acceleration** (or “pickup”), they mean the vehicle is able to increase speed relatively quickly. The time it takes to accelerate from one speed to another is the **rate of acceleration**.

Deceleration, on the other hand, refers to decreasing speed, or **slowing down**. The time it takes to decelerate from one speed to another is the **rate of deceleration**.

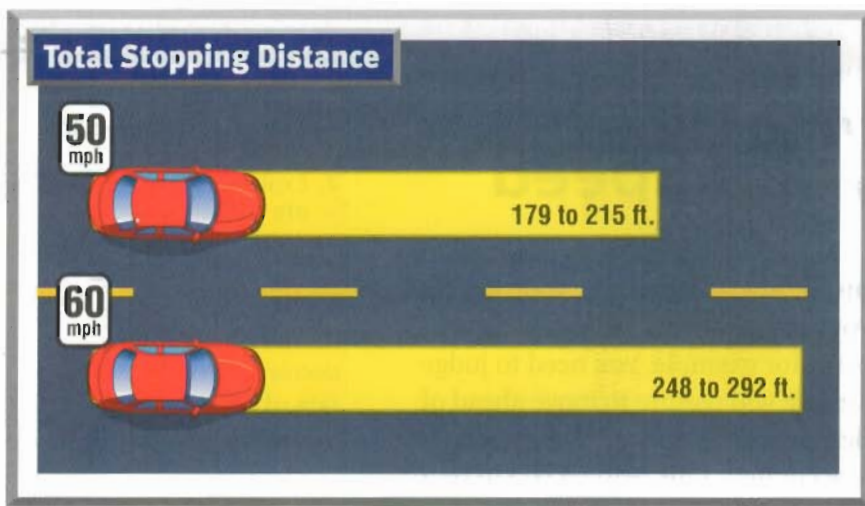
Several factors affect a vehicle's acceleration, including the power of the engine, the transmission and differential gear ratios, adhesion between the drive wheels and the road surface, and the weight the engine is pulling. Your ability to drive safely **and effectively** depends in large part on the knowledgeable use of your vehicle's **acceleration**.

CONNECTIONS

Math

A speedometer tells you how fast you're traveling at a given moment, but to find out your average speed for a particular distance, you'll need to do a little math.

Average speed equals total distance traveled **divided by total time traveled**. Suppose, for example, the distance from your home to the beach is 70 miles. One afternoon, it takes you an hour and a half to drive there. Your average speed equals 70 (total miles driven) divided by $1\frac{1}{2}$ (total time), or just over 46 miles per hour.



◆ *The greater the speed, the greater the distance needed to brake the car to a stop. Here the total stopping distance—which is the distance traveled from perception to response—for a car traveling at 50 mph ranges from 179 feet to 215 feet.*

high speeds means you must allow more time to pass when traveling at 50 mph than when moving at 30 mph.

Equally important to keep in mind is that deceleration rates, like acceleration rates, vary with speed. At higher speeds, your vehicle's rate of deceleration is lower. So a vehicle traveling at 60 mph needs a great deal more time and space to slow and brake to a stop than the same vehicle traveling at 30 mph.

A vehicle's rates of acceleration and deceleration also vary with weight. A heavy truck, for example, needs much more time and distance to accelerate or decelerate than does a passenger vehicle.

Acceleration and Deceleration Rates Vary

Rate of acceleration varies with speed. At higher speeds, a vehicle's rate of acceleration will be lower. As a result, it will generally take more time to accelerate from 45 mph to 55 mph than from 20 mph to 30 mph.

Understanding this principle is important for risk management. For example, the lower acceleration rate at

Maintaining a Constant Speed

The ability of vehicles to maintain a given speed varies greatly. Large passenger vehicles with high-horsepower, 6- or 8-cylinder engines and mid-size and sport sedans with turbo-charged small engines generally have good acceleration and can maintain their speed climbing a hill. An underpowered subcompact vehicle, however, may not be able to hold its speed because of its small engine.

Many large vehicles also have difficulty maintaining their speed. Tractor-trailer rigs and interstate buses have huge engines, but these large vehicles accelerate very slowly.

Monitoring Your Speed

New drivers find it difficult to control the speed of their vehicle simply by observing the

TIPS FOR NEW DRIVERS

Accelerating

- For best control when accelerating, rest the heel of your foot on the floor, and press the pedal gently with your toes.
- As a general rule, accelerate gradually. Beginning drivers sometimes make errors when they increase speed quickly. Accelerating gradually also saves fuel.
- No two cars accelerate exactly the same way. When driving an unfamiliar vehicle, allow yourself time to get used to the feel of the gas pedal and to the vehicle's acceleration capability.

speed of traffic around them. As a result, they frequently check the speedometer. Such checks should be made with quick glances, as traffic conditions permit.

With experience, you'll become more aware of clues to your vehicle's performance and speed. You'll notice, for example, that as speed varies, there's a difference in the vehicle's vibration and in the level of sound from the tires, the wind, and the engine. Drivers of vehicles with manual transmissions must make a special effort to learn to judge speed because they have to make speed-related decisions about shifting gears.

Note that it is harder to estimate your vehicle's speed immediately after you've made a sharp change in speed. If, for example, you've been driving at 20 mph and rapidly accelerate to 45 mph, you'll feel as though you're moving faster than you actually are.

On the other hand, if you've been traveling at highway speeds and suddenly enter a 25-mph zone, your tendency may be to slow down less than you should because you've become accustomed to moving at higher speeds. The best way to prevent yourself from speeding in such an instance is to check your speedometer.

Lesson 3 Review

1. What is acceleration? How are acceleration and speed related?
2. What is deceleration? How is deceleration related to speed?



◆ *New drivers often increase speed without realizing it, so check your speedometer frequently.*

WHAT WOULD YOU DO?

A photograph of a multi-lane highway. A large red semi-truck is in the right lane, and a dark car is in the left lane. A green overhead sign reads "Euclid St NEXT RIGHT". The sky is clear and blue.

Which vehicle probably needs more time and distance to accelerate: the truck or the car? How would knowing this help you manage time and space to reduce risk?

OBJECTIVES

1. Describe the procedures for steering straight ahead and when turning.
2. Explain how to steer in Reverse gear.

KEY TERMS

tracking
hand-over-hand steering
push-pull-feed steering

Learning How to Steer the Vehicle

Many new drivers assume that they know all they need to know about steering a vehicle. After all, they think, they've been steering bicycles and sleds since they were children. Such activities do share elements in common with steering a motor vehicle. However, there are important differences new drivers must learn.

For one thing, unlike a bicycle or sled, a motor vehicle has power independent of the driver's own efforts—a great deal of power. Moreover, steering is not simply a matter of pointing the vehicle in the direction you want to go. Steering is a basic means of risk management.

How Can You Steer Your Vehicle Forward and Through Turns?

Suppose you're about to drive through an intersection. Suddenly another vehicle crosses in front of you. The best way to avoid a collision is to brake your vehicle, right? Not necessarily.

It often takes less time and space to steer away from an object than to brake to avoid hitting it. (Of course, to avoid a collision by steering, you must have previously identified an area into which you can safely steer.)

Steering plays a particularly important part in risk management when you're traveling at speeds over 25 or 30 mph. At such speeds, steering may often be your only way to avoid a collision, because higher speeds increase the distance and time needed to stop the vehicle.

Holding the Steering Wheel

When steering in a straight line or through a moderate curve, grasp the steering wheel firmly with your fingers. Many experienced drivers place their hands at 9 o'clock and 3 o'clock or at 8 o'clock and 4 o'clock positions. Others position their hands on the lower part of the wheel, in the 7 o'clock and 5 o'clock positions. Follow the recommendations of your instructor. No matter which hand position you use, your thumbs should rest on the wheel.

Tracking and Steering

Keeping your vehicle moving on the path of travel that you have chosen is called **tracking**. Tracking requires a driver to make whatever

FYI

The average driver takes $\frac{1}{2}$ to $\frac{3}{4}$ of a second to step on the brake after identifying a dangerous situation. Thus, even at 20 mph, your vehicle would travel at least 20 feet before you could step on the brake.

steering adjustments are needed to hold the desired course.

To track smoothly, learn to direct your attention to points 20 to 30 seconds ahead along your intended path of travel. Choose these points on the basis of where you want to go and traffic conditions.

If you're like many new drivers, you'll find steering a vehicle more challenging than you'd anticipated, particularly when traveling on winding roads. At first, you may not notice small changes in your vehicle's position in a traffic lane. You may fail to adjust your steering in time and then tend to overcorrect, causing the car to zigzag rather than move in a straight line. You'll tend to look at the right edge marker or center line while driving through curves. Doing so will also cause the vehicle to zigzag. However, with practice and concentration, you'll learn to look through curves and well ahead of your vehicle along your path of travel. You'll soon improve your ability to keep your vehicle on track with only minor steering adjustments.



◆ **Think of the steering wheel as the face of a clock so that you can position your hands correctly.**

Steering in a Straight Line

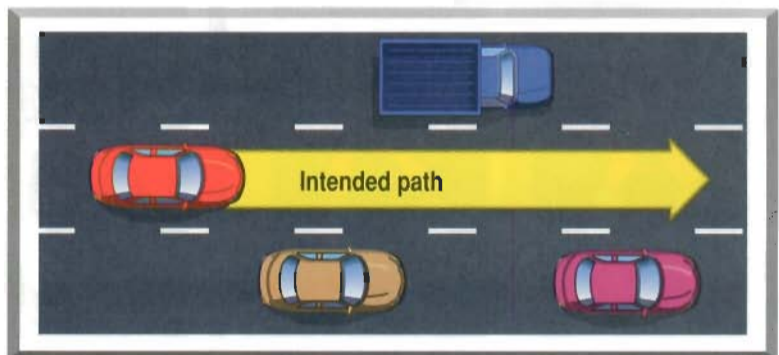
The steering adjustments you must make on a straight road are small but critical. Be on the alert for gradual changes in the position of your vehicle. It should not “wander” in its lane.

Steer toward a point in the center of your path of travel, looking well ahead as you drive. When you look to the point where you will steer, you will automatically steer in the proper direction.

As you drive, check your mirrors whenever you spot anything along your intended path of travel that could cause you to change speed or position.

To look in your rearview mirror, move just your eyes. To look in your sideview mirror, turn your head only slightly.

◆ **Always look and steer toward a point in the center of your intended path of travel.**



Steering to Turn

Steering through a turn requires more steering-wheel movement than does lane positioning. To turn corners smoothly and safely, you need to develop a good sense of timing and make a habit of searching a wider area.

When steering through a turn, keep in mind that your vehicle's rear wheels do not follow the same path as the front wheels. They have a smaller turning radius, so you must allow ample space along the path you're turning. Without this space, your rear wheels may hit the curb or other objects.

Two specific steering techniques are effective for turning the wheel: hand-over-hand and push-pull-feed. The following procedures describe how to make a right turn; to make a left turn, reverse the movements.

Hand-over-hand steering To turn right using **hand-over-hand steering**, use your left hand to push the steering wheel up, around, and down. At the same time, bring your right hand across your left forearm to grip the wheel on the far side. Then use your right hand to pull the side of the wheel up, around, and down. Repeat this series of movements as often as needed to complete the turn, making any left or right steering corrections that may be required.

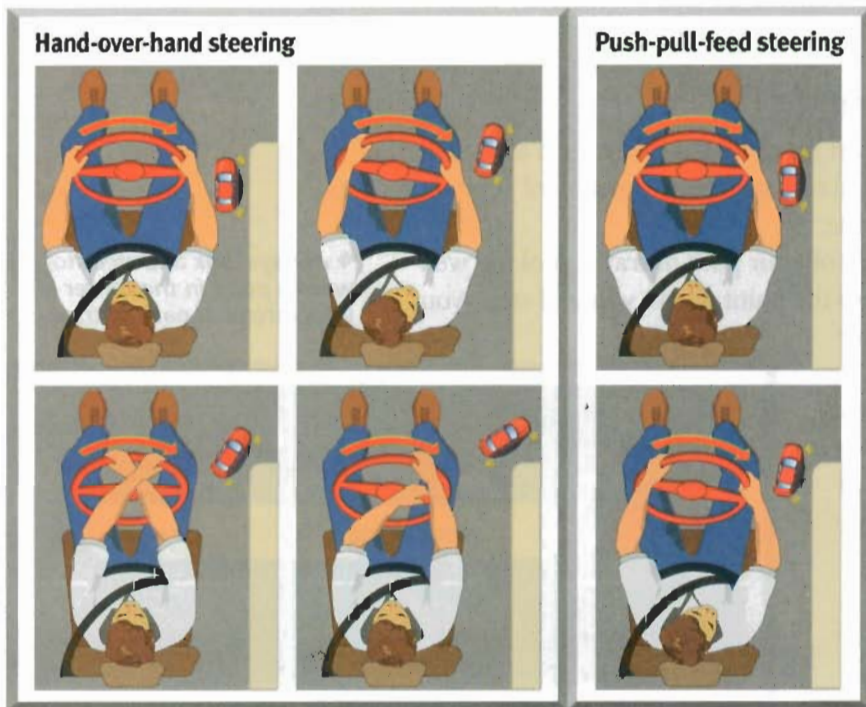
Hand-over-hand steering provides effective vehicle control when you're steering through tight-radius turns, such as hard turns and hairpin turns.

Push-pull-feed steering Grasp the steering wheel with the right hand resting between 3 and 5 o'clock and the left hand between 7 and 9 o'clock.

One hand pushes the wheel up toward 12 o'clock. (Use the left hand for right turns and vice versa.) At the same time, the other hand slides up to 1 o'clock for the right turn (or 11 o'clock for the left turn), grasps the wheel, and pulls it down. While the pulling hand goes down, the pushing hand releases its grip and returns to its original position to continue the process as needed.

Push-pull-feed steering lets you keep both your hands on the steering wheel at all times. The positioning of your hands causes less fatigue on longer drives and gives you better steering control in an

◆ *If you are not too tall or somewhat stout, you may find push-pull-feed steering more comfortable.*



emergency. Also, you can sit farther from the steering wheel. Since your arms never cross over the face of the steering wheel, there is less chance of injury if the driver's side air bag deploys.

Whichever steering method you choose, use the following guidelines when making a turn.

- Look beyond the turn to the point you want to reach. Identify this point before you start to turn.
- Always use your directional signal. Check the roadway ahead and both mirrors before starting to turn. Check the mirrors again after completing the turn, waiting if possible until you've straightened the wheels.
- On a hard turn, slow down to maintain control as you enter the turn. Accelerate gently about halfway through to pull out of the turn.
- With your eyes on the point you want to reach, start to steer back to the straight-ahead position when you're about midway through the turn. Do this by reversing the hand-over-hand or push-pull-feed movements.

How Do You Steer in Reverse?

When steering in Reverse gear, you have to learn where to look and how to control direction and speed. Always back slowly. When you steer left or right while backing, the vehicle's movements are more abrupt.

When you are backing a vehicle, visibility through the rear window is limited. Head restraints and passengers may further block your view. Backing while looking into the rearview mirror restricts your view even more.

To maximize your ability to see, turn your head and shoulders so that you can look back in the direction you want to move. When you move backward, the rear of your vehicle moves in the direction that you turn the steering wheel, while the front swings in the opposite direction.

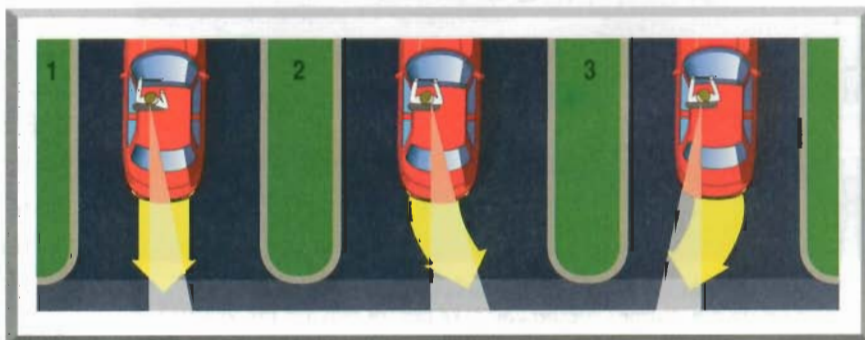
Note, too, that when you back a vehicle, the two points most likely to hit something are the rear side of the vehicle in the direction in which you are turning and the front side of the vehicle opposite the direction in which you are turning.

♦ Don't forget to look over both shoulders when you steer to the rear.

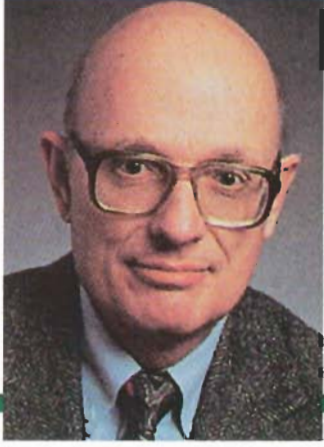
Steering to the Rear

Follow these steps when backing a vehicle.

1. With your foot on the brake, shift into Reverse gear. If you are backing straight, place your left hand on the top of the



ADVICE FROM THE EXPERTS



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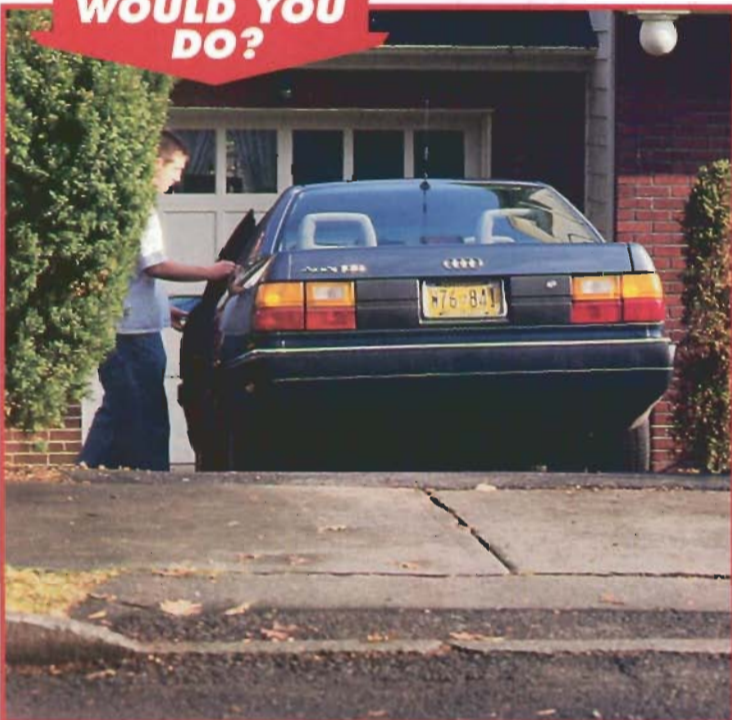
When preparing to stop, always check your inside mirror for vehicles that are following you. Maintaining adequate space around your vehicle is very important, and knowing what is behind you is critical to your safety and that of your passengers.

When stopping behind another vehicle, maintain an adequate space cushion in front of your vehicle. The best way to do this is to make sure that from the driver's seated position, the rear tires of the vehicle ahead and a small portion of the roadway are completely visible to you.

steering wheel and your right arm across the top of the seat. Look over your right shoulder. If you are backing to the right or left, keep both hands on the wheel and look over your shoulder in the direction you want to move.

2. Ease pressure off the brake slowly. Give yourself plenty of time to monitor the rear and front of your vehicle. To move the vehicle slowly, apply only slight pressure, if any, to the accelerator.
3. Look at the point where you want to go so that you can identify and correct steering errors early. Turn the wheel as needed.
4. Concentrate your visual search out the rear window, with quick, repeated glances to the front. Keep alert to ensure that the vehicle is moving in the right direction and that the front end is not about to strike anything.
5. Continue to look out the rear window as you bring the vehicle to a stop.

WHAT WOULD YOU DO?




*What procedures would you follow to back out of this driveway?
What safety precautions should you take before moving the vehicle?*

Lesson 4 Review

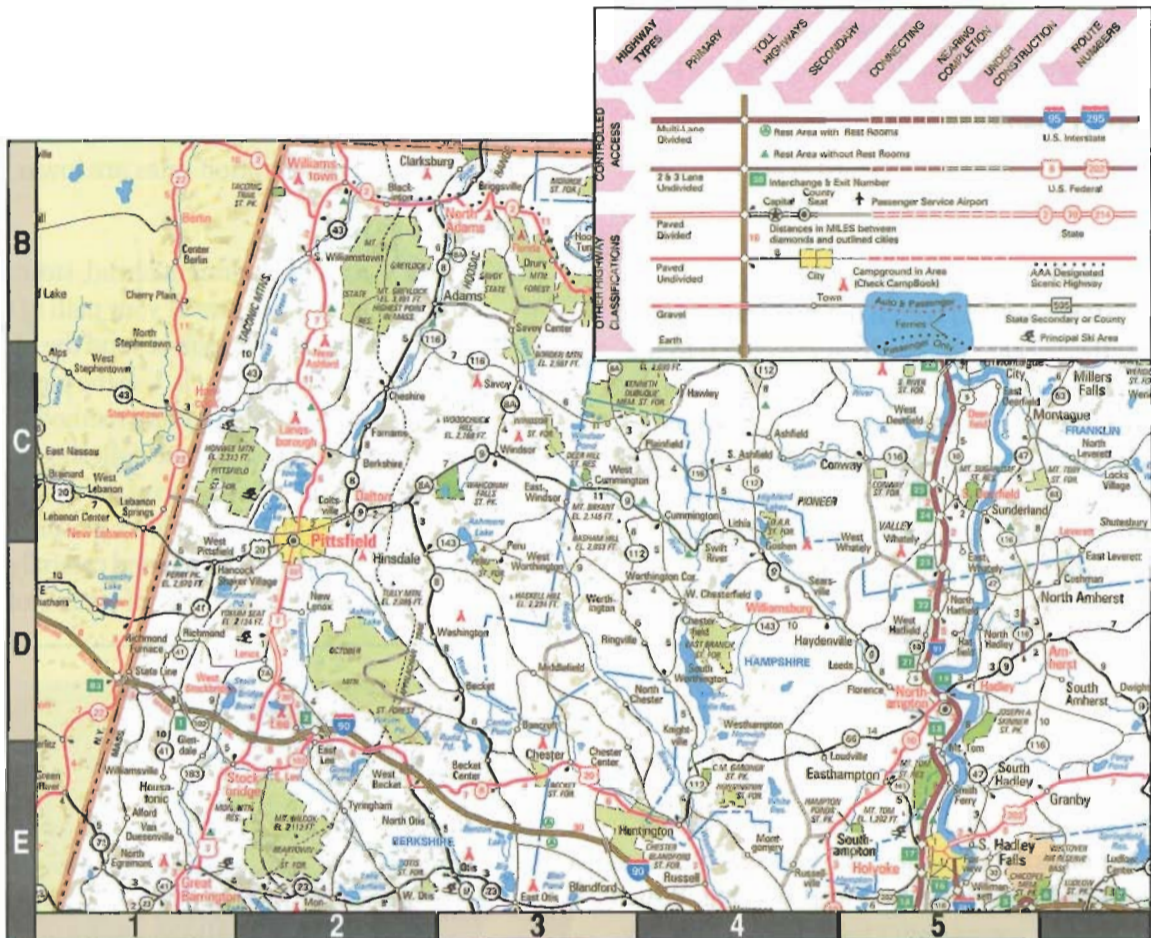
1. What procedures would you follow to steer a vehicle straight ahead? To turn?
2. How do you back a vehicle?

Understanding Roadway Classifications

Maps help you get where you are going. They also tell about the kinds of roads you can use to get there. Most maps have a key such as this one. Find  at coordinates D, 5 on the map. The map key indicates that this is a no-toll, limited-access highway. See the dots along Route 2? The key tells you that this is a scenic route. Find Route 9. The key tells you that Route 9 is a paved secondary road that is not divided.

Try It Yourself

1. What can you tell about Route 7 between Pittsfield and Stockbridge?
2. What kind of road connects Adams and Savoy Center?
3. Describe the different kinds of roads you can take from Southampton to Pittsfield.



CHAPTER 8 REVIEW

KEY POINTS

Lesson One

1. To start a vehicle with an automatic transmission, put the gear selector in Park. Set the automatic choke if it applies to your vehicle. Then press the accelerator and turn the key. To move the vehicle, step on the brake and shift to Drive or Reverse. Release the parking brake, take your foot off the brake, and accelerate gradually.
2. To slow and stop a vehicle with an automatic transmission, check your mirrors, tap your brake pedal, and apply steady pressure to the brake pedal, easing up slightly as you come to a halt.

Lesson Two

1. You need to change forward gears by manually shifting up or down in a manual transmission. An automatic transmission set in Drive will shift the forward gears for you.
2. To start a vehicle with a manual transmission, set the parking brake. Press the clutch to the floor, step on the brake, shift into Neutral, and turn the key. To move the vehicle, shift into First and release the parking brake. As you let the clutch up, move your right foot from the brake to the accelerator and press gently. To stop the vehicle, press the clutch to the floor,

and move your right foot to the brake. Apply smooth pressure until the vehicle stops.

3. First gear sets the vehicle in motion. Second gear is used for speeds up to 15 to 25 mph or to start on ice or to drive in heavy snow. Third gear is used for speeds over 25 mph (3-speed transmissions) or speeds up to 30 or 40 mph (4- or 5-speed transmissions). Fourth or Fifth gear is used for driving at higher speeds.

Lesson Three

1. Acceleration is an increase of speed. Deceleration means a slowing down.
2. The rate of acceleration or deceleration varies with speed. At higher speeds, a vehicle's acceleration and deceleration rates are lower.

Lesson Four

1. To steer your vehicle straight ahead, steer toward a point in the center of your path of travel. When steering to turn, look beyond the turn to the point you want to reach. Use the hand-over-hand or push-pull-feed steering method.
2. When backing, look over your right shoulder, place your left hand at the top of the steering wheel, and steer in the direction you want the vehicle to move. Proceed slowly and carefully, monitoring both the rear and front of your vehicle.

PROJECTS

1. Talk to someone who has been driving for several years. Ask what lessons this driver has learned through experience and what tips he or she might offer you as a beginning driver.
2. Demonstrate the difference between the hand-over-hand and push-pull-feed steering. Which technique seems easier to you? Why? Survey several drivers to find out which method they use and why.

interNET CONNECTION



Use the Internet to download information on how antilock brakes work. Investigate the advantages and disadvantages of an antilock brake system. drivedred.glencoe.com

CHAPTER 8 REVIEW

CHAPTER TEST

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

- You can set an automatic choke by
 - pumping the brake pedal.
 - pressing the gas pedal to the floor once and then releasing it.
 - turning the ignition key to "on."
- One advantage of push-pull-feed steering is that
 - your hands are on the wheel at all times.
 - your hands are free to adjust the mirrors.
 - you can back more easily.
- With a manual transmission, the speed of the vehicle determines
 - the tightness of the vehicle's turning radius.
 - the choice of forward gear.
 - the need for an occasional fuel injection.
- A vehicle's rate of acceleration is lower at
 - warmer engine temperatures.
 - high speeds.
 - low speeds.
- To avoid rolling backward when starting on an uphill grade, you should
 - set your parking brake firmly.
 - lock the brakes.
 - start the engine in third gear.
- As you drive, you will develop the ability to estimate your speed by
 - sensing the vehicle's friction point.
 - riding the clutch.
 - sensing a difference in the vehicle's vibrations.
- To start a vehicle with an automatic transmission,
 - first shift into Second gear.
 - keep your foot on the brake pedal.
 - make sure the gear selector lever is in Park.
- To change gears in a vehicle with a manual transmission, you must

- press the clutch pedal to the floor.
 - engage in threshold braking.
 - rapidly decelerate.
- When turning, always
 - sound your horn.
 - use your directional signal.
 - shift into Reverse.
 - When driving around a curve, you should focus
 - beyond the turn, on the point you want to reach.
 - on the road directly in front of you.
 - on objects in your rearview mirror.

Write the word or phrase that best completes each sentence.

acceleration	manual transmission
tracking	automatic transmission
clutch	rate of deceleration

- _____ means an increase of speed.
- A vehicle's _____ can have four or five forward gears.
- The key to smooth _____ operation is sensing the friction point.
- _____ means keeping your vehicle moving on the path that you have chosen to travel.
- The time it takes for a vehicle to slow down is the _____.

DRIVER'S LOG

In this chapter, you have learned about the basic procedures you need to know to operate a vehicle. Write at least two paragraphs giving your ideas about why these procedures are almost second nature to experienced drivers and why they should become second nature to you.