

# **Texas Driver Education Classroom and In-car Instruction Model Curriculum**

## **Module Nine**

### **Texas Driver Responsibilities:**

#### **Vehicle Functions**

- **VEHICLE FUNCTIONS/MALFUNCTIONS**
- **ANTI-LOCK BRAKING SYSTEMS**
- **VEHICLE PERFORMANCE**
- **HIGHWAY TRANSPORTATION SYSTEM**

#### **AGENCIES**

## **FACT SHEETS**

**Instrument Panel**

- It is essential to know what the alert lights, warning lights, and gauges on the instrument panel mean and where they are located.
- Become familiar with a vehicle by reading the owner's manual
- This will help prevent the driver from being caught off-guard should a problem arise.

**Warning symbols**

- Temperature light or gauge—This light/gauge warns you when the coolant in the engine is too hot or too low. If it comes on, pull off the road when safe and get professional help. Caution: never attempt to remove the radiator cap when the engine is hot.
- Oil pressure warning light or gauge—This light/gauge warns you when the oil is not circulating at the proper pressure or there is not enough oil. This light/gauge does not tell you the amount of oil in the engine. It is recommended not to drive for too many miles should this occur.

**Alternator/Generator warning light or gauge** - Your vehicle's electrical system is in trouble if this light comes on or the gauge shows "discharge" while the engine is running.

- Discharge occurs when the alternator is not generating enough electricity to charge the battery.
- Be aware that if this happens the engine must use electricity stored in the battery
- Turn off as many electrical devices as possible (i.e., the radio, heater/AC, etc.)
- Caution: Have this checked without delay. If the battery is drained, the car can shut off.

**Brake system warning light** - This warning light serves two purposes:

- To show the parking brake is set before moving the vehicle
- To alert you part or all of the braking system is not working properly or in some vehicles, the brake fluid is too low.

If the brake system is not working properly, brake gradually to a stop, have the vehicle towed, and have the problem corrected.

**Fact Sheet**  
**Module 9**    **Fact Sheet F-9.2**    **Brake Failures**

**Total brake failure** rarely happens on newer vehicles because of cross matching brakes on dual master cylinders. The warning light will usually give warning if one of the dual cylinders malfunction. If it does occur on an older vehicle, the driver is usually braking for a stop.

- Pump the brake pedal quickly. After three or four pumps the driver will know if the brakes are going to hold. This action may build up enough brake pressure to steer the vehicle off the highway and stop safely.

If this doesn't work:

- Downshift to a lower gear. This uses the braking power of the engine to slow the vehicle. Find an escape route—a safe exit from the highway.
- Activate the hazard lights to warn other drivers of a problem.
- Apply the parking brake gradually.
  - You can quickly release the parking brake if the vehicle begins to skid.
  - You can reapply the parking brake as needed.
  - Select a safe path while vehicle slows down.

If these steps do not stop the vehicle:

- Look for an uphill slope.
- Rub wheels against a curb.
- Scrape against guardrails.
- Should a collision be unavoidable, steer for a sideswipe rather than colliding head-on into something solid.

**Power brake failure**

- Power brake failure is usually the loss of power that helps you brake.
- The power stops if the engine stops.
- However, the power brake will function normally for one more application of the pedal.
- Apply the brake.
- Modulate pressure without releasing.
- If the brake pedal is released, the driver will have to press harder on the brake pedal to stop.
- The vehicle will stop.

**Anti-lock braking system (ABS) light**—This alert light advises if the ABS is functioning properly. If the warning light comes on while driving, it indicates a problem with the system.

- Should this occur, have the problem corrected at a service center (i.e., car dealership, service station, etc.)

**Air bag alert/warning light**—This alert/warning light advises if the air bags are in proper working condition.

- When the ignition is turned on, the air bag alert light comes on for a few seconds, and then goes off.
- If the air bags are not in proper operating condition, the warning light will stay on.
- Have this problem corrected at a service center.

**Service engine soon light**—A computer monitors operation of a vehicle's fuel, ignition, and emission control systems.

- This alert light should come on when the ignition is on, but the engine is not running.
- If the alert light does not come on, have the system fixed right away.
- If the warning light stays on, or it comes on while driving, the computer is indicating that there is a problem.
- Take the vehicle to a service center.

**Door ajar light**—This comes on if a door(s) is not closed completely. The warning light will stay on until this is corrected.

- Caution: Do not try to open and close the door that is ajar while driving.

**Low fuel warning light**—The fuel gauge advises how much fuel is in the tank when the ignition is on (E is for empty, get some fuel; F is for Full). When the low fuel light activates, it means there are approximately two gallons remaining. Stop and refuel as soon as possible.

**Fact Sheet**  
**Module 9**    **Fact Sheet F-9.4**    **Steering and Suspension**

**The steering system** controls the position of the front wheels in order to permit the driver to change the direction of the vehicle.

**Basic components of the steering wheel system:**

- Steering wheel—driver control that controls the position of the front wheels; may be adjustable (i.e. tilt steering wheel) .
- Steering column—connects the steering wheel to the steering gear box. This is collapsible on impact to protect the driver.
- Steering gearbox—converts the rotary motion of the wheel into linear motion of the steering linkage.
- Power steering—hydraulic pump impelled by a belt connected to the engine that facilitates steering (most vehicles today have power steering).

Avoid turning the steering wheel when the vehicle is not moving

- This causes wear on the steering system.
- Never force the steering at the limit of travel.
- Back off slightly the wheels will still be fully turned.
- Forcing causes early failure.

Avoid deep potholes, curbs, and any other sudden or hard impacts that may cause damage to the steering components. Have the steering aligned at least once a year and after any serious impacts.

Periodically inspect the belt at the power steering pump and check power steering fluid (consult the owner's manual for exact locations).

Steering problems often develop gradually rather than suddenly. Any steering problem is serious and should be repaired immediately.

Common indications of problems include:

- Play or excess movement in the steering wheel.
- Steering difficulty, even though the tires are properly inflated.
- Shimmying or wobbling or shaking or pulling to one side under normal driving conditions.
- Squealing sounds when making turns.

**Note:** *Keep hands in the steering position of between the 9 and 3 o'clock and the 7 and 5 o'clock position to avoid injury from an air bag depending on the steering wheel openings. Injuries from the airbag include serious hand, arm, head, or eye injuries.*

**Suspension system**

Includes a series of rods, bars, springs, and other components. This system keeps the wheels and tires pointed in the direction of the steer.

- Supports the weight of the vehicle.
- Absorbs the shocks caused by road irregularities.
- Provides flexibility while ensuring vehicle stability and driveability.

Basic Components:

- Springs.
- Leaf in the rear.
- Coil front and sometimes rear.
- Torsion bars.
- Support the weight of the vehicle and flex to absorb road shocks.

**Shock absorbers**

One installed at each wheel to control the oscillating action of the springs to minimize movement and stabilize the wheel contact with the road.

- Stabilizer bars (sway bar).
- Added to the front and sometimes the rear suspension to minimize body roll (lean or sway) on turns and bumps.

**Macpherson strut**

A suspension unit that combines the shock and spring into one component.

- If the vehicle bounces more than usual, have shocks checked where the vehicle is serviced.
- If the vehicle does not appear to be level (when unloaded), have the springs checked for sag, wear and/or breakage where the vehicle is serviced.
- If the tire wear is uneven, there may be a problem with the suspension system. Have this checked where the vehicle is serviced.
- Check the owner's manual for the recommended intervals for servicing or replacing the vehicle's shocks, struts, and joints.
- The steering and suspension will not break down without warning.
- Following the recommended service intervals in the owner's manual will permit early diagnosis and repair.

**Fact Sheet**  
**Module 9**      **Fact Sheet F-9.6**      **Tires****Tires are the vehicle's lifelines to the roadway.**

Tires have two functions:

- They are air-filled cushions that absorb most of the shocks caused by road hazards.
  - The tires flex, or give, as they meet these irregularities.
  - This reduces the effect of the shocks on the vehicle and the passengers.
- Second, the tires grip the road to provide traction.
  - This enables the driver to accelerate, brake, and steer the vehicle.
  - This reduces the effect of the shocks on the vehicle and the passengers.

**Some Basic Definitions**

Ply—layers of material (cords impregnated with rubber) under the tread. Each ply strengthens the tire and gives it shape.

There are two basic tire types:

- Bias ply—plies are criss-crossed. This makes the casing strong in all directions. However, these tires wear more rapidly and provide less traction.
- Radial ply—plies are parallel and perpendicular to the tread.
- Belts (usually steel) are then attached in the same position as the tread, which is then applied to the sidewall and results in more flexibility.

Greater traction—The actual gripping power between the tires and the roadway surface. Traction provides:

- Improved tread mileage.
- Improved fuel economy.

Information about the tire's construction, size, recommended inflation levels, and carrying capacity is clearly marked on the sidewall of the tire.

New tires usually have a paper label attached with additional information.

Maintain the manufacturer's recommended air pressure in the tires at all times.

Keep a reliable tire gauge in the vehicle and use it regularly. Maintaining proper air pressure in the tire will yield maximum fuel efficiency and tire mileage. Too little air pressure can make handling the vehicle more difficult. Tires will not get as much mileage either. *Caution: The risk of a blowout with underinflated tires is greater.*

Always check the tires for wear whenever the vehicle is serviced. If abnormal wear is noticed, have a service technician correct the problem.

Fact Sheet  
Module 9

## Fact Sheet F-9.7 Tires and Traction Control

**Tire quality and grading.**

All tires sold in the United States are rated on the Uniform Tire Quality Grading System. This can be read on the sidewall of the tire. Tires are rated by:

- Traction - measured by the ability to stop a car in straight-ahead motion on a wet surface. A tire graded A has the best traction performance, B grading is an above average rating, and C grading indicates the tire meets government standards.
- Temperature - indicates the tire's ability to withstand heat. A tire graded A is the most heat-resistant and less likely to suffer a blowout under the same conditions as tires with grades of B or C.

The higher the treadwear rating, the greater the mileage. A tire with a treadwear rating of 150 is expected to last 50 percent longer than one graded at 100.

Keep safety in mind when new tires are needed. Compare and decide which type of tire offers the best value for the kind of driving done. Check the owner's manual for recommendations on tires for the vehicle.

**Traction—the actual gripping power between the tires and the roadway surface:**

- The more traction there is, the greater the gripping power.
- Friction is the force that keeps each tire from sliding on the road.
- The friction created by the tire on the road is traction.
- Traction makes it possible for the vehicle to grip the road so the driver can change speed and direction.

Two things are necessary to maintain ideal levels of traction:

- Vehicle must be in good condition;
- Road must be smooth, paved, level, and clean.

**Vehicle condition**

As a vehicle ages, it must be maintained in order to perform correctly.

- If tires, shock absorbers, or steering system parts are allowed to wear, traction and control will be reduced.
- Good shock absorbers are very important for maintaining traction.
- Worn shock absorbers will limit vehicle control; have them replaced as soon as possible.
- Worn or improperly inflated tires also will limit control. Check tire pressure and tread frequently, and replace tires as needed.



Fact Sheet  
Module 9

## Fact Sheet F-9.8 Fuel and Ignition Electronics

**The fuel system**

The automotive fuel system is designed to provide the correct amount of fuel and air to the engine under all operating conditions and power demands. Many vehicles today use a fuel injection system (replacing the carburetor) to deliver the fuel under pressure into the combustion chambers or into the air flow just as it enters each individual cylinder. This maximizes power and economy. The basic components of the fuel system are:

- Fuel tank—a reservoir for fuel. A tank device controls the fuel gauge to inform the driver of the fuel available.
- Fuel lines—tubes connect the tank to the carburetor or injection system.
- Carburetor—mixes the fuel and air and supplies it to the cylinders. The gas pedal controls the carburetor.
- Fuel filter—removes dirt and other contaminants from the fuel. Replace as recommended in owner's manual.
- Fuel pump—electrical or mechanical device that forces fuel from the tank to the carburetor.
- Air filter—removes dirt and dust particles from air entering the engine. Replace at each tune-up.
- Choke—restricts air flow and increases idle speed (when cold).
- Turbo - turbine to increase the air entering the cylinders.

To keep the vehicle's fuel system in good shape, follow these simple tips:

- Keep fuel level above a quarter of a tank.
- Keep condensation out of the fuel lines.
- Avoid fouling (if fuel injection system) or clogging (carburetor) the system with contaminants.
- Do not run out of gas.
- Follow regular maintenance schedules and instructions in the owner's manual.

**Ignition electronics**

The ignition system sets off combustion in the engine's cylinders by converting the 12-volt current to high voltage surges. The electrical system is involved in the ignition process and provides the electrical power needed to operate the vehicle's lights, controls, and accessories. Basic components of ignition electronics include:

- The ignition system—consists of the ignition switch, distributor assembly, ignition coil, spark plugs, wiring, and battery.

The electrical system is broken down as follows:

- The charging system—produces electrical power while the engine is running to operate all the electrical components and recharges the battery. This consists of a drive belt, alternator, voltage regulator, wiring, and battery.
- The starting system—permits the driver to turn the ignition switch to activate an electric motor, Solenoid switch, wiring, and battery.
- The accessory circuits—power the lights, safety systems, and accessories. This system includes the fuse box, wiring, and any electrically-powered equipment.

Other components and their definitions:

- The fuse box—protects the electrical equipment. Refer to the owner's manual for location in the vehicle. Keep spare fuses in vehicle at all times.
- The ignition coil—transforms the 12-volt current to a surge of current of many thousands of volts.
- The spark plugs—produce spark to ignite the air-fuel mixture.
- The battery—stores energy in chemical form so it can supply the electricity to start the engine.
- The distributor—controls the production and distribution of the surges to the spark plugs.
- The starter—an electrical motor that cranks the engine (turns the flywheel) during starting.
- The alternator—driven by the belt, charges the battery, and operates electrical component.

Check the vehicle's owner's manual for the recommended tune-up and electrical service intervals.

**Fact Sheet**  
**Module 9**      **Fact Sheet F-9.9**      **Braking Systems**

**The brake system** permits the driver to slow or stop the rotation of the tires. The friction of the tires against the road surface will then slow and/or stop the vehicle. Traction is measured by the ability to stop a car in straight-ahead motion on a wet surface. Modern vehicles are equipped with two braking systems:

- Dual hydraulic brake system.
- Mechanical brake system (parking or emergency brake).

Good brakes are essential for the safe operation of a vehicle. The life expectancy and performance of a vehicle's brakes depend on how they are used and maintained. The basic components of a brake system include:

- Disc brakes—superior brakes (cool faster) that utilize a pinching action on a metal disc to slow or stop tire rotation of the tire. Disc brakes are usually at the front wheels. The front brakes do 70% of the braking. Disc brakes are available as an option at all four wheels.
- Drum brakes—brake shoes push outward on a rotating drum. Because they are enclosed, they retain heat.
- Dual Master Cylinder—brake pedal applies pressure on two pistons that pressurize the brake fluid. The fluid transmits this pressure to each wheel where it activates the disc or drum brake mechanism. A reservoir (sometimes two) supplies extra fluid when needed. The dual systems operate independently in case one should fail.
- Brake lines—double-walled steel tubes full of brake fluid that conduct the hydraulic pressure.
- Power brake—an engine-activated booster unit that reduces the effort required to apply the hydraulic brakes. Will operate one more time if the engine should stop functioning.
- Parking brake—a lever or foot pedal that mechanically (cables and levers) activates the rear brakes only (most vehicles). Can be used for parking and if the hydraulic brakes fail.
- Indicator light—comes on if one of the dual hydraulic brake systems should fail or, in some vehicles, if the brake fluid is low. If this occurs, have a service technician check the problem.

Braking distance is the distance a vehicle travels once the brakes are applied. A driver's experience and skill in braking, the kinetic energy of the vehicle, the mechanical condition of the vehicle, and road conditions all come into play. What does this mean?

- A vehicle going 20 mph can stop within 20 feet.
- A vehicle going 40 mph takes 80 feet to stop.
- A vehicle going 60 mph stops at 180 feet.

Notice the vehicle in the last two examples increased by 20 mph each and how much further the vehicle traveled in the braking distance. Other factors that affect braking distances:

- Vehicle condition—a poorly maintained vehicle takes longer to stop.
- Roadway surface—rain, snow, ice, dirt, wet leaves, and gravel reduce road traction and increase stopping distance.
- Hills—braking distance increases when driving downhill.
- Loads—heavy loads increase your braking distance.

**Antilock Braking System (ABS)**

If the vehicle has ABS, the driver can better control steering while braking. In a hard braking situation, the pedal will vibrate or chatter. This is normal. The driver's foot must stay firmly planted and the pedal depressed to the floor for the ABS brakes to work properly.

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## **Module Nine**

### **Texas Driver Responsibilities:**

#### **Vehicle Functions**

- **VEHICLE FUNCTIONS/MALFUNCTIONS**
- **ANTI-LOCK BRAKING SYSTEMS**
- **VEHICLE PERFORMANCE**
- **HIGHWAY TRANSPORTATION SYSTEM**

#### **AGENCIES**

## **WORKSHEETS**

**W-9.1 Procedures for Vehicle Malfunctions**

**Name** \_\_\_\_\_

**Tire Blowout**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_

**Steering Failure**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

**Car Fire**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

**Accelerator Failure**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

**Engine Failure**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_

**W-9.2 ABS Pre Test**

Name \_\_\_\_\_

**Part One Directions. Circle the correct letter on the test sheet. (4 points each)**

1. As road conditions worsen, so does your control over which driving input?
  - a. braking.
  - b. steering.
  - c. accelerating.
  - d. all of the above.
  
2. How do you recognize that ABS is activated when using the brake?
  - a. an immediate stop.
  - b. tire and wheel lock-up.
  - c. very hard pedal pressure.
  - d. vibration and changes in pedal pressure.
  
3. You are driving in the right lane of an icy, two-way, four-lane street when you see a car in your lane is stopped for a stop sign. Your car is equipped with ABS, so you should\_\_\_\_.
  - a. shift to a lower gear.
  - b. brake soft, clear traffic, and steer to the right.
  - c. brake hard, clear traffic, and steer to the open space.
  - d. steer into a snowbank to the right.
  
4. You are driving in the right lane of an icy, two-way, four-lane street when you see a car in your lane is stopped for a stop sign. Your car is not equipped with ABS, so you should\_\_\_\_.
  - a. shift to a lower gear, clear right lane, brake softly.
  - b. brake softly, clear lane, and steer to the open space.
  - c. brake hard, clear lane, steer to the left, and maintain brake pressure.
  - d. brake hard, clear lane, and steer into a snowbank to the right.
  
5. If you must stop quickly on a slippery street surface, you should \_\_\_\_\_.
  - a. apply soft braking pressure to engage ABS.
  - b. apply firm, steady pressure with ABS engaged.
  - c. apply jabbing brake with ABS engaged.
  - d. not engage ABS.

**Part Two Directions: Please place the correct answer on the back of this sheet. (8 points each)**

6. What does the abbreviation "ABS" stand for?
7. What is the difference between ABS and conventional automobile brakes?
8. What is the idea behind 4-wheel anti-lock brakes?
9. Name two ways that the anti-lock brake system can be deactivated by the driver.
10. What sensations will a driver feel when ABS engages?
11. What effect does road surface have on stopping distance with ABS?
12. What is the difference using 2-wheel ABS?
13. How do you know that your vehicle is equipped with ABS?
14. List four things one should do with ABS.
15. List four things one should not do with ABS.

**W-9.4 ABS Post Test**

Name \_\_\_\_\_

**Part One Directions. Circle the correct letter on the test sheet. (4 points each)**

1. As road conditions worsen, so does your control over which driving input?
  - a. braking.
  - b. steering.
  - c. accelerating.
  - d. all of the above.
  
2. How do you recognize that ABS is activated when using the brake?
  - a. an immediate stop.
  - b. tire and wheel lock-up.
  - c. very hard pedal pressure.
  - d. vibration and changes in pedal pressure.
  
3. You are driving in the right lane of an icy, two-way, four-lane street when you see a car in your lane is stopped for a stop sign. Your car is equipped with ABS, so you should \_\_\_\_\_.
  - a. shift to a lower gear.
  - b. brake soft, clear traffic, and steer to the right.
  - c. brake hard, clear traffic, and steer to the open space.
  - d. steer into a snowbank to the right.
  
4. You are driving in the right lane of an icy, two-way, four-lane street when you see a car in your lane is stopped for a stop sign. Your car is not equipped with ABS, so you should \_\_\_\_\_.
  - a. shift to a lower gear, clear right lane, brake softly.
  - b. brake softly, clear lane, and steer to the open space.
  - c. brake hard, clear lane, steer to the left, and maintain brake pressure.
  - d. brake hard, clear lane, and steer into a snowbank to the right.
  
5. If you must stop quickly on a slippery street surface, you should \_\_\_\_\_.
  - a. apply soft braking pressure to engage ABS.
  - b. apply firm, steady pressure with ABS engaged.
  - c. apply jabbing brake with ABS engaged.
  - d. not engage ABS.

**Part Two Directions: Please place the correct answer on the back of this sheet. (8 points each)**

6. What does the abbreviation "ABS" stand for?
7. What is the difference between ABS and conventional automobile brakes?
8. What is the idea behind 4-wheel anti-lock brakes?
9. Name two ways that the anti-lock brake system can be deactivated by the driver.
10. What sensations will a driver feel when ABS engages?
11. What effect does road surface have on stopping distance with ABS?
12. What is the difference using 2-wheel ABS?
13. How do you know that your vehicle is equipped with ABS?
14. List four things one should do with ABS.
15. List four things one should not do with ABS.

**Part One: Directions. Please place the correct letter on the answer sheet provided.**

- As road conditions worsen, so does your control over which driving input?
  - a. braking.
  - b. steering.
  - c. accelerating.
  - d. all of the above.\* (Curriculum, p. 5)**
- How do you recognize that ABS is activated when using the brake?
  - a. an immediate stop.
  - b. tire and wheel lock-up.
  - c. very hard pedal pressure.
  - d. vibration and changes in pedal pressure.\*(Curriculum, p. 12)**
- You are driving in the right lane of an icy, two-way, four-lane street when you see a car in your lane is stopped for a stop sign. Your car is equipped with ABS, so you should \_\_\_\_\_.
  - a. shift to a lower gear.
  - b. brake soft, clear traffic, and steer to the right.
  - c. brake hard, clear traffic, and steer to the open space.\* (Curriculum, p. 7)**
  - d. steer into a snowbank to the right.
- You are driving in the right lane of an icy, two-way, four-lane street when you see a car in your lane is stopped for a stop sign. Your car is not equipped with ABS, so you should \_\_\_\_\_.
  - a. shift to a lower gear, clear right lane, brake softly.
  - b. brake softly, clear lane, and steer to the open space.\* (Curriculum, p. 7)**
  - c. brake hard, clear lane, steer to the left, and maintain brake pressure.
  - d. brake hard, clear lane, and steer into a snowbank to the right.
- If you must stop quickly on a slippery street surface, you should \_\_\_\_\_.
  - a. apply soft braking pressure to engage ABS.
  - b. **apply firm, steady pressure with ABS engaged. (Curriculum, p. 9)**
  - c. apply jabbing brake with ABS engaged.
  - d. not engage ABS.

**Part Two: Directions. Please place the correct answer on the answer sheet provided.**

- What does the abbreviation "ABS" stand for?  
**[THE ABBREVIATION STANDS FOR ANTI-LOCK BRAKE SYSTEM (SEE OUTSIDE COVER, PAMPHLET)].**
- What is the difference between ABS and conventional automobile brakes?  
**[CONVENTIONAL BRAKES ALLOW WHEELS TO BE LOCKED BY THE DRIVER AND PRODUCE A LOSS OF ROLLING TRACTION. ABS ENGAGES WHEN A WHEEL SPEED SENSOR DETECTS IMPENDING WHEEL LOCK-UP, ALLOWING THE VEHICLE TO BE STEERED WHILE HELPING MAINTAIN VEHICLE STABILITY (SEE INSIDE COLUMN 4, PAMPHLET)].**
- What is the idea behind 4-wheel anti-lock brakes?  
**[4-WHEEL ABS IS DESIGNED TO PREVENT SKIDDING AND MAINTAIN LIMITED STEERING CONTROL DURING EMERGENCY BRAKING (SEE COVER, PAMPHLET)].**
- Name two ways that the anti-lock brake system can be deactivated by the driver.  
**[BY REMOVING THE HARD PRESSURE FROM THE BRAKE PEDAL OR BY PUMPING THE BRAKES (SEE INSIDE COLUMN 1, PAMPHLET)].**
- What sensations will a driver feel when ABS engages?  
**[BRAKES MAY FEEL HARDER TO PUSH, HAVE A VIBRATION, AND NOISES MAY OCCUR (SEE INSIDE COLUMN 1, PAMPHLET)].**
- What effect does road surface have on stopping distance with ABS?  
**[STOPPING DISTANCE MAY BE LONGER ON SOME SURFACES, SUCH AS FRESHLY FALLEN SNOW OR LOOSE GRAVEL, BUT THE ABILITY TO STEER THE VEHICLE REMAINS (SEE INSIDE COLUMN 1-2, PAMPHLET)].**
- What is the difference using 2-wheel ABS?  
**[2-WHEEL ABS, FOUND ONLY ON LIGHT TRUCKS, IS DESIGNED TO ELIMINATE REAR WHEEL SKID WHICH MAY PRODUCE A LOSS OF VEHICLE STABILITY SUCH AS A SUDDEN MOVEMENT TO THE RIGHT OR LEFT. THE FRONT WHEELS MAY STILL LOCK-UP. THE DRIVER MUST RECOGNIZE THAT ALTHOUGH THE VEHICLE HAS 2-WHEEL ABS ON THE REAR WHEELS, HE/SHE MUST USE CONVENTIONAL BRAKING TECHNIQUES WITH THIS 2-WHEEL ANTI-LOCK BRAKE SYSTEM (SEE INSIDE COLUMN 4, PAMPHLET)].**
- How do you know that your vehicle is equipped with ABS?  
**[THERE MAY BE A MARKING ON THE VEHICLE, BUT ABS-EQUIPPED CARS HAVE A DASHBOARD ALERT SYSTEM THAT LIGHTS BRIEFLY AT START-UP (SEE INSIDE COLUMN 1-2, PAMPHLET)].**
- List four things one should do with ABS.  
**[ADD TO YOUR FOLLOWING TIME OR DISTANCE INTERVAL IN POOR WEATHER AS WITH CONVENTIONAL BRAKES, PRACTICE USING ABS, KEEP YOUR FOOT FIRMLY ON BRAKE, AND CHECK THE OWNER'S MANUAL FOR SPECIAL CONCERNS (SEE INSIDE COLUMN 2, PAMPHLET)].**
- List four things one should not do with ABS.  
**[DON'T DRIVE MORE AGGRESSIVELY, DON'T PUMP THE BRAKES, DON'T FORGET TO STEER AFTER CHECKING FOR CLEARANCE, AND DON'T BE ALARMED BY NOISE AND VIBRATION WHICH MAY OCCUR (SEE INSIDE COLUMN 3, PAMPHLET)].**

### W-9.3 ABS Concerns and Issues

Name \_\_\_\_\_

#### Class Activity

Answer the following questions to the best of your ability using the “America Brakes for Safety” illustrated pamphlet provided by the ABS Education Alliance.

- What does the abbreviation "ABS" stand for?
- What is the difference between ABS and conventional automobile brakes?
- What is the idea behind 4-wheel anti-lock brakes?
- Name two ways that the anti-lock brake system can be deactivated by the driver.
- What sensations will a driver feel when ABS engages?
- What effect does road surface have on stopping distance with ABS?
- What is the difference using 2-wheel ABS?
- How do you know that your vehicle is equipped with ABS?
- List four things one should do with ABS.
- List four things one should **not** do with ABS.



**W-9.5 Vehicle Performance**

**Name** \_\_\_\_\_

Trucks \_\_\_\_\_

\_\_\_\_\_

Trains \_\_\_\_\_

\_\_\_\_\_

Sport Utility Vehicles \_\_\_\_\_

\_\_\_\_\_

Recreational Vehicles \_\_\_\_\_

\_\_\_\_\_

Motorcycles \_\_\_\_\_

\_\_\_\_\_

Bicycles, Mopeds, Scooters \_\_\_\_\_

\_\_\_\_\_

Construction Vehicles \_\_\_\_\_

\_\_\_\_\_

Oversize Vehicles \_\_\_\_\_

\_\_\_\_\_

Farm Machinery \_\_\_\_\_

\_\_\_\_\_

Horse-drawn Vehicles \_\_\_\_\_

\_\_\_\_\_

# **Texas Driver Education Classroom and In-car Instruction Model Curriculum**

## **Module Nine**

### **Texas Driver Responsibilities:**

#### **Vehicle Functions**

- **VEHICLE FUNCTIONS/MALFUNCTIONS**
- **ANTI-LOCK BRAKING SYSTEMS**
- **VEHICLE PERFORMANCE**
- **HIGHWAY TRANSPORTATION SYSTEM**

#### **AGENCIES**

## **EVALUATION AND ASSESSMENTS**

**MA-9.1 Vehicle Functions and Malfunctions**

Please do not write on the test. Select the best answer and place the appropriate letter (A, B, C, D) on the answer sheet provided.

1. When you want to do preventive maintenance on your car, the best source of information is \_\_\_\_\_.
  - A. the auto parts shop.
  - B. a friendly mechanic.
  - C. your vehicle owner's manual.
  - D. the local auto club.
  
2. If your car's temperature light comes on while driving, you should \_\_\_\_\_.
  - A. pull over safely, open the hood and radiator cap and check the problem.
  - B. pull over safely, open the hood, and let the vehicle cool before checking anything.
  - C. pull over safely, open the hood, and check the oil level.
  - D. pull over safely, open the hood, and check the transmission fluid.
  
3. If the left front tire blows out while you are driving, \_\_\_\_\_.
  - A. the vehicle will pull sharply to the right.
  - B. the vehicle will pull sharply to the left.
  - C. the vehicle will wobble slightly to the right.
  - D. the vehicle will wobble slightly to the left.
  
4. If any tire blows out while you are driving, what should you NOT do?
  - A. Grip the steering wheel firmly.
  - B. Take your foot off the gas pedal.
  - C. Allow the vehicle to slow gradually and safely.
  - D. Brake hard.
  
5. If the gas pedal becomes stuck in the "down" position and you are increasing speed, what is the first thing you should do to control the vehicle speed?
  - A. Grip the steering wheel firmly.
  - B. Shift to "neutral" gear.
  - C. Brake hard.
  - D. Pull quickly off the roadway.
  
6. If you are making a turn and your engine shuts off in the middle of the intersection, the first thing you should do is \_\_\_\_\_.
  - A. stop in the intersection and restart the vehicle.
  - B. shift to "neutral," complete the turn, then pull off and restart the engine.
  - C. pull over immediately and stop.
  - D. look for a service center to help restart the vehicle.
  
7. If you have total steering failure while driving, you should \_\_\_\_\_.
  - A. stop as quickly as possible using the parking brake correctly.
  - B. stop as quickly as possible using the brake pedal.
  - C. stop as quickly as possible by scrubbing tires on the curb.
  - D. stop as quickly as possible by hitting small trees and bushes.

## Evaluation and Assessment

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8. If your vehicle has power steering and it fails or quits working while driving \_\_\_\_\_.
- A. drive to the nearest service center for repairs.
  - B. drive to the local auto club and report it.
  - C. your vehicle cannot be steered, so park it.
  - D. your vehicle can still be steered, with much effort, to a safe stopping point.
9. Which driving habit listed will help reduce the possibility of steering system problems?
- A. Avoid hitting curbs or deep potholes on the road.
  - B. Avoid turning the steering wheel beyond its limits.
  - C. Inspect the power steering fluid level and fill when low.
  - D. A, B, and C are all good habits to reduce steering system problems.
10. Your vehicle bounces a lot when you drive. You notice the tires are wearing unevenly. Your vehicle appears to be leaning to one side when it is parked. These are all signs of \_\_\_\_\_.
- A. a suspension system problem.
  - B. an electrical system problem.
  - C. an exhaust system problem.
  - D. a braking system problem.
11. Tire inflation is important to both safety and tire wear. What is the proper amount of air to have in a tire?
- A. 10 pounds below the manufacturer's recommended pressure on the side of the tire.
  - B. 10 pounds above the manufacturer's recommended pressure on the side of the tire.
  - C. At the manufacturer's recommended pressure on the side of the tire.
  - D. At 50 p.s.i., no matter what the manufacturer recommends.
12. Most new vehicles are equipped with anti-lock brakes (ABS). When these brakes are working properly \_\_\_\_\_.
- A. they vibrate when you push hard on the pedal.
  - B. they allow you to steer while braking hard.
  - C. both A and B are correct.
  - D. neither A nor B are correct.
13. Parts of the electrical system that need to be checked regularly and replaced on occasion are \_\_\_\_\_.
- A. the fuel filter and gas cap.
  - B. the muffler and exhaust pipe.
  - C. the brake shoes and brake drums or discs.
  - D. the battery and spark plugs.
14. When should you have a "tune-up" completed on your vehicle?
- A. When the car owner's manual recommends it.
  - B. Every 10,000 miles.
  - C. When the oil becomes dirty.
  - D. When the transmission fluid is low.

15. When should you use parking lights on your vehicle?
- A. At night when driving a short distance.
  - B. When driving on a bright, sunny day.
  - C. On a rainy day when visibility is low.
  - D. When parked next to the roadway for a short period of time.
16. You are coming to an intersection. You see a tractor-trailer coming to the intersection from the left and starting to turn right. What should you expect from the tractor-trailer?
- A. It will not interfere with your path of travel.
  - B. It will turn wide and use part of your lane to complete its turn.
  - C. It will stop and let you pass.
  - D. It will speed up and turn quickly.
17. The driver of a large truck or tractor-trailer rig will have the most difficulty seeing \_\_\_\_\_.
- A. ahead of his rig.
  - B. overhead clearance signs approaching at bridges.
  - C. to the sides and rear of his vehicle.
  - D. down into passing vehicles.
18. When following a large truck or tractor-trailer \_\_\_\_\_.
- A. increase your following distance.
  - B. stay behind at all times for protection.
  - C. drive in the driver's blind spots.
  - D. keep the truck ahead to block the wind.
19. Where do most train/car collisions occur?
- A. At crossings that have warning signals and gates.
  - B. At crossings with no warning signals or gates.
  - C. At the train station in the city.
  - D. At the busiest time of day for commuters.
20. Which of these characteristics is true about motorcycles and their riders?
- A. They offer the rider little or no protection in a crash.
  - B. They speed up and can stop quickly.
  - C. They are sometimes difficult to see in traffic.
  - D. A, B and C are all correct.
21. When you are driving and following a motorcycle, you should \_\_\_\_\_.
- A. pass the motorcyclist the first chance you have.
  - B. increase your following distance.
  - C. wave at the motorcyclist to get his/her attention.
  - D. blow your horn so they can move out of the way.

## Evaluation and Assessment

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22. When passing someone riding a bicycle ahead of you \_\_\_\_\_.
- A. blow your horn to pass them.
  - B. get close to them and make them move over.
  - C. slow your speed and increase the space between you and the bicyclist.
  - D. have them move to the sidewalk to ride.
23. If the bicycle rider near you is a child, \_\_\_\_\_.
- A. expect them to know Texas's bicycle laws.
  - B. expect them to be in total control of the bicycle.
  - C. expect them to know all of the safety rules when riding.
  - D. expect anything could happen and adjust your driving.
24. Construction zones on roadways are set up \_\_\_\_\_.
- A. to protect the workers and help traffic move through smoothly.
  - B. to speed up construction.
  - C. so car drivers can see the construction taking place.
  - D. to impede and slow the flow of traffic.
25. Construction vehicles around construction zones \_\_\_\_\_.
- A. have the right of way.
  - B. are usually large and slow moving.
  - C. are there to create problems for the car driver.
  - D. cannot be seen when driving through the zone.
26. When approaching and driving through a construction zone, you should \_\_\_\_\_.
- A. get through quickly to avoid dust.
  - B. slow your speed and adjust your vehicle's position.
  - C. watch the construction taking place.
  - D. turn on the radio to drown out the noise.
27. If you break a traffic law in a construction zone in Texas, \_\_\_\_\_.
- A. the judge will forgive you because of the delay.
  - B. there will be no record of it on your driving record.
  - C. fines will be double what they are for breaking laws in other areas.
  - D. fines are the same amount as any other traffic violation.
28. If you approach an oversized vehicle marked with a "Wide Load" sign, you should \_\_\_\_\_.
- A. make it move to the edge of the road.
  - B. speed up to get around it.
  - C. flash your lights to warn other drivers.
  - D. slow your speed and increase the distance you are from it.

29. Farm machinery and horse-drawn carriages are marked in the rear with a special "Slow-Moving Vehicle" sign. What should you do when you approach one of these vehicles?
- A. Increase speed to get around it quickly.
  - B. Slow down and pass it quickly.
  - C. Slow down and pass when safe and legal to do so.
  - D. Slow down and blow your horn.
30. Which of the following agencies has NOTHING to do with highway safety in Texas?
- A. Texas State Police.
  - B. Texas Legislature.
  - C. Texas Education Agency.
  - D. Texas Veterans' Administration.
31. How do you recognize that ABS is activated when using the brake?
- A. An immediate stop.
  - B. Tire and wheel lock-up.
  - C. Very hard pedal pressure.
  - D. Vibration and changes in pedal pressure.
32. You are driving in the right lane of an icy, two-way, four-lane street when you see a car in your lane is stopped for a stop sign. Your car is equipped with ABS, so you should \_\_\_\_\_.
- A. shift to a lower gear.
  - B. brake soft, clear traffic, and steer to the right.
  - C. brake hard, clear traffic, and steer to the open space.
  - D. steer into a snowbank to the right.
33. You are driving in the right lane of an icy, two-way, four-lane street when you see a car in your lane is stopped for a stop sign. Your car is not equipped with ABS, so you should \_\_\_\_\_.
- A. shift to a lower gear, clear right lane, brake softly.
  - B. brake softly, clear lane, and steer to the open space.
  - C. brake hard, clear lane, steer to the left, and maintain brake pressure.
  - D. brake hard, clear lane, and steer into a snowbank to the right.
34. If you must stop quickly on a slippery street surface, you should apply \_\_\_\_\_.
- A. soft braking pressure to engage ABS.
  - B. firm, steady pressure with ABS engaged.
  - C. jabbing brake with ABS engaged.
  - D. do not engage ABS.
35. What does the abbreviation "ABS" stand for?
36. What is the difference between ABS and conventional automobile brakes?
37. What is the idea behind 4-wheel anti-lock brakes?
38. Name two ways that the anti-lock brake system can be deactivated by the driver.
39. What sensations will a driver feel when ABS engages?
40. What effect does road surface have on stopping distance with ABS?

Module 9 Answer Sheet

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Score: \_\_\_\_\_

- |           |           |
|-----------|-----------|
| 1. _____  | 21. _____ |
| 2. _____  | 22. _____ |
| 3. _____  | 23. _____ |
| 4. _____  | 24. _____ |
| 5. _____  | 25. _____ |
| 6. _____  | 26. _____ |
| 7. _____  | 27. _____ |
| 8. _____  | 28. _____ |
| 9. _____  | 29. _____ |
| 10. _____ | 30. _____ |
| 11. _____ | 31. _____ |
| 12. _____ | 32. _____ |
| 13. _____ | 33. _____ |
| 14. _____ | 34. _____ |
| 15. _____ | 35. _____ |
| 16. _____ | 36. _____ |
| 17. _____ | 37. _____ |
| 18. _____ | 38. _____ |
| 19. _____ | 39. _____ |
| 20. _____ | 40. _____ |



**Module 9 Answer Key**

- |     |   |     |   |
|-----|---|-----|---|
| 1.  | C | 21. | B   |
| 2.  | B | 22. | C   |
| 3.  | B | 23. | D   |
| 4.  | D | 24. | A   |
| 5.  | B | 25. | B   |
| 6.  | B | 26. | B   |
| 7.  | A | 27. | C   |
| 8.  | D | 28. | D   |
| 9.  | D | 29. | C   |
| 10. | A | 30. | D   |
| 11. | C | 31. | D   |
| 12. | C | 32. | C   |
| 13. | D | 33. | B   |
| 14. | A | 34. | B   |
| 15. | D | 35. | THE ABBREVIATION STANDS FOR ANTI-LOCK BRAKE SYSTEM.   |
| 16. | B | 36. | CONVENTIONAL BRAKES ALLOW WHEELS TO BE LOCKED BY THE DRIVER AND PRODUCE A LOSS OF ROLLING TRACTION. ABS ENGAGES WHEN A WHEEL SPEED SENSOR DETECTS IMPENDING WHEEL LOCK-UP, ALLOWING THE VEHICLE TO BE STEERED WHILE HELPING MAINTAIN VEHICLE STABILITY. |
| 17. | C | 37. | 4-WHEEL ABS IS DESIGNED TO PREVENT SKIDDING AND MAINTAIN LIMITED STEERING CONTROL DURING EMERGENCY BRAKING.   |
| 18. | A | 38. | BY REMOVING THE HARD PRESSURE FROM THE BRAKE PEDAL OR BY PUMPING THE BRAKES.  |
| 19. | B | 39. | BRAKES MAY FEEL HARDER TO PUSH, HAVE A VIBRATION, AND NOISES MAY OCCUR.   |
| 20. | D | 40. | STOPPING DISTANCE MAY BE LONGER ON SOME SURFACES, SUCH AS FRESHLY FALLEN SNOW OR LOOSE GRAVEL, BUT THE ABILITY TO STEER THE VEHICLE REMAINS.  |

# **Texas Driver Education Classroom and In-car Instruction Model Curriculum**

## **Module Nine**

### **Texas Driver Responsibilities:**

#### **Vehicle Functions**

- **VEHICLE FUNCTIONS/MALFUNCTIONS**
- **ANTI-LOCK BRAKING SYSTEMS**
- **VEHICLE PERFORMANCE**
- **HIGHWAY TRANSPORTATION SYSTEM**

#### **AGENCIES**

## **TRANSPARENCIES**

Texas Education Agency  
Texas Department of Public Safety  
Texas Department of Transportation

