



Commercial Driver's License (CDL) Training Program

Participant Study Guide

You're here because you want to be a bus driver for First Student. As a requirement to become a First Student driver, you must pass the Commercial Driver's License test.

The Training program you are participating in was designed specifically to help you pass written portions of the tests you'll need to receive your CDL permit with required endorsements.

This Study Guide is an outline of most of the important information you'll need to know to be successful on your CDL test. Follow this guide as you go through the training program. Take notes as often as possible. Your notes will help you remember better! Each of the practice questions that accompany the training videos are included in this book, so make sure you record your answers to study from later.

In the back of this Guide you'll find all the Test Tips mentioned in the training videos. Review them, and learn from them.

To accompany this Guide you'll also receive a booklet with CDL practice questions for continued review and practice. The more questions you read and answer, the better prepared you'll be.

Be sure to use this Study Guide well - both during and after the training session videos.

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HOW TO USE THIS STUDY GUIDE

NOTES

This Study Guide contains all the major topics and points covered in the First Student CDL Training Course.

To get the most out of this class, you should follow along in this Guide while you watch the videos. The key points and diagrams presented in the videos are contained in this Study Guide.

Pay particular attention to **words in bold type** - they indicate material you will likely be tested on.

There is a column on the edge of each page for taking notes if you wish. Sometimes the column will contain notes or images you should review.

At the beginning of each section, you'll find some provocative questions called Food for Thought - to get you thinking about the topic that will be covered next.

At the end of each section, you will find a practice quiz with questions to help test your recall of the material. Mark the correct answers from the quizzes to help you study later.

At the end of this Study Guide, we've included a valuable study aid - a list of Test Tips that can improve your score by helping you figure out which answer is correct if you're not sure.

In addition, you'll receive a Practice Test booklet that contains practice tests for each of the areas you'll need to study.

If you pay attention to the videos, use the Study Guide, and study hard afterward, you should have no trouble passing the CDL test.

NOTES

INTRODUCTION

A commercial driver's license - or CDL- is required for all school bus drivers. Every professional driver working for First Student will need a CDL license with two or three required endorsements. To meet the basic requirements for becoming a First Student driver, you will have to take three CDL

knowledge tests:

1. The General Knowledge test
2. The Passenger Transport endorsement test
3. The School Bus endorsement test

If the branch where you will be working has buses with air brakes, you will also need to take a test to receive an air brakes endorsement. If your branch does not have buses with air brakes, you will NOT need to take a test to receive an air brakes endorsement. If, in the future, you want to drive a vehicle with air brakes, you can add the air brakes endorsement to your CDL by studying the material in this study guide and taking the test.

There are two parts to the CDL test: the written tests and the skills tests. First, you must pass the general knowledge written test and the tests for each endorsement. That gets you a CDL permit. Second, you'll need to practice your school bus handling to be able to pass three skills tests which you'll take in a school bus:

- A pre-trip vehicle inspection test,
- A basic vehicle control skills test and
- An on-road driving test

After passing both the written and the skills tests, you'll receive your commercial driver's license.

CDL TRIAL QUIZ

NOTES

1. Which of the following is not a CDL skills examination?

- a. Materials handling test
- b. Pre-trip vehicle inspection
- c. Basic control skills test
- d. On-road test

2. How many warning triangles are you required to carry in your vehicle?

- a. 1
- b. 2
- c. 3
- d. 4

3. When using a helper to back up, what is the most important hand signal?

- a. Slow down.
- b. Pull forward.
- c. Come straight back.
- d. Stop

4. Properly adjusted outside left and right side convex mirrors allow visibility in what area?

- a. The entire side of the bus up to the front tires at ground level, in front of the rear tires touching the ground and at least one traffic lane on either side of the bus.
- b. The area directly in front of the bus.
- c. Front of the rear tires touching the ground, the entire side of the bus up to the mirror mounts, and at least one traffic lane on either side of the bus.

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LICENSING RULES

The Commercial Motor Vehicle Safety Act of 1986 requires each state to meet the same minimum standards for commercial driver licensing. The standards require commercial motor vehicle drivers to get a Commercial Driver's License (CDL). This section covers some of the rules regarding getting a CDL.

You must have a CDL to operate:

- Any single vehicle with a gross vehicle weight rating (GVWR) of 26,001 pounds or more.
- A trailer with a GVWR of more than 10,000 pounds if the gross combination weight rating (GCWR) is 26,001 pounds or more.
- A vehicle designed to transport 16 or more passengers (including the driver).
- Any size vehicle that is used in the transportation of any material that requires hazardous materials placards or any quantity of a material listed as a select agent or toxin in 42 CFR 73.

Since school buses meet two criteria:

**A - their GVWR is often over 30,000 pounds, and
C - carrying more than 15 passengers,
all school bus drivers need a Commercial Driver's License.**

The class of license needed is either Class B or C.

ACRONYMS YOU NEED TO KNOW:

GVW / GCW =
actual weights

GVWR / GCWR =
recommended weights

GVW	Gross Vehicle Weight Total weight of a single vehicle + cargo load.
GCW	Gross Combination Vehicle Weight Total weight of a combination vehicle - a powered unit plus trailer(s) + cargo load.
GVWR	Gross Vehicle Weight Rating The maximum GVW specified by the manufacturer for a single vehicle + cargo load.
GCWR	Gross Combination Weight Rating The maximum GCW specified by the manufacturer for a specific combination of vehicles + load.

DRIVER DISQUALIFICATIONS

General

You may not drive a commercial motor vehicle (CMV) if you are disqualified for any reason. A school bus is considered a CMV.

Alcohol, Leaving the Scene of an Accident, and Commission of a Felony

It is illegal to operate a CMV if your blood alcohol concentration (BAC) is .04% or more. If you operate a CMV, you shall be deemed to have given your consent to alcohol testing.

You will lose your CDL for at least one year for a first offense for:

- Driving a CMV if your BAC is .04% or higher.
- Driving a CMV under the influence of alcohol.
- Refusing to undergo blood alcohol testing.
- Driving a CMV while under the influence of a controlled substance.
- Leaving the scene of an accident involving a CMV.
- Committing a felony involving the use of a CMV.

You will lose your CDL for at least three years if the offense occurs while you are operating a CNIV that is placarded for hazardous materials.

You will lose your CDL for life for a second offense.

You will lose your CDL for life if you use a CNIV to commit a felony involving controlled substances.

You will be put out-of-service for 24 hours if you have any detectable amount of alcohol under .04%.

Serious Traffic Violations

Serious traffic violations are excessive speeding (15 mph or more above the posted limit), reckless driving, improper or erratic lane changes, following a vehicle too closely, and traffic offenses committed in a CMV in connection with fatal traffic accidents.

You will lose your CDL:

- For at least 60 days if you have committed two serious traffic violations within a three-year period involving a CMV.
- For at least 120 days for three serious traffic violations within a three-year period involving a CMV.

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Violation of Out-of-Service Orders

You will lose your CDL:

- For at least 90 days if you have committed your first violation of an out-of-service violation order.
- For at least one year if you have committed two out-of-service violation orders in a ten-year period.
- For at least three years if you have committed three or more out-of-service violation orders in a ten-year period.

Railroad-highway Grade Crossing Violations

You will lose your CDL:

- For at least 60 days for your first violation.
- For at least 120 days for your second violation within any three-year period.
- For at least one year for your third violation within any three-year period.

These violations include violation of a federal, state or local law or regulation pertaining to one of the following six offenses at a railroad-highway grade crossing:

- For drivers who are not required to always stop, failing to stop before reaching the crossing if the tracks are not clear.
- For drivers who are not required to always stop, failing to slow down and check that the tracks are clear of an approaching train.
- For all drivers failing to have sufficient space to drive completely through the crossing without stopping.
- For all drivers failing to obey a traffic control device or the directions of an enforcement official at the crossing.
- For all drivers failing to negotiate a crossing because of insufficient undercarriage clearance.

Hazardous Materials Endorsement, Background Check and Disqualifications

If you require a hazardous materials endorsement, you will be required to submit your fingerprints and be subject to a background check. You will be denied or lose the endorsement if you:

- Are not a lawful, permanent resident of the United States.
- Renounce your United States citizenship.
- Are wanted or under indictment of certain felonies.
- Have a conviction in military or civilian court for certain felonies.
- Have been adjudicated as a mental defective or committed to a mental institution.
- Are considered to pose a security threat as determined by the Transportation Security Administration.

OTHER CDL RULES

There are other federal and state rules that affect drivers operating CMVs in all states. Among them are:

- You cannot have more than one license. If you break this rule, a court may fine you up to \$5,000 or put you in jail and keep your home state license and return any others.
- You must notify your employer within 30 days of conviction for any traffic violations (except parking). This is true no matter what type of vehicle you were driving.
- You must notify your motor vehicle licensing agency within 30 days if you are convicted in any other jurisdiction of any traffic violation (except parking). This is true no matter what type of vehicle you were driving.
- You must notify your employer if your license is suspended, revoked, or canceled, or if you are disqualified from driving.
- You must give your employer information on all driving jobs you have held for the past 10 years. You must do this when you apply for a commercial driving job.
- No one can drive a commercial motor vehicle without a CDL. A court may fine you up to \$5,000 or put you in jail for breaking this rule.
- If you have a hazardous materials endorsement you must notify and surrender your hazardous materials endorsement to the state that issued your CDL within 24 hours of any conviction or indictment in any jurisdiction, civilian or military, for, or found not guilty by reason of insanity of a disqualifying crime listed in 49 CFR 1572.103; who is adjudicated as a mental defective or committed to a mental institution as specified in 49 CFR 1572.109; or who renounces his or her US citizenship;
- Your employer may not let you drive a commercial motor vehicle if you have more than one license or if your CDL is suspended or revoked. A court may fine the employer up to \$5,000 or put him/her in jail for breaking this rule.
- All states are connected to one computerized system to share information about CDL drivers. The states will check on drivers' accident records and be sure that drivers do not have more than one CDL.

Your state may have additional rules that you must also obey.

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LICENSING RULES QUIZ

1. If you get a speeding ticket while on vacation you must tell your employer.
 - a. True
 - b. False

2. For drivers who are always required to stop, failing to stop before driving onto a railroad crossing will cause you to lose your CDL:
 - a. For at least 60 days for your first violation
 - b. For at least 1 year for your first violation
 - c. Only if it is an alcohol related violation
 - d. Only if you are caught leaving the scene

3. Which of the following is not a CDL skills examination?
 - a. Materials handling test
 - b. Pre-trip vehicle inspection
 - c. Basic control skills test
 - d. On-road test

4. You are convicted of speeding in your personal vehicle and issued a ticket. The law says that CDL holders must report convictions for traffic violations to employers how soon?
 - a. Within 72 hours (except parking violations)
 - b. Within 3 business days (except parking violations)
 - c. Within 30 business days (except parking violations)
 - d. Within 72 hours (except parking violations)

5. If you are caught drinking while driving a commercial motor vehicle, you will:
 - a. Be fined up to \$5,000
 - b. Receive a 90-day suspension
 - c. Lose your CDL for at least one year
 - d. Be put on probation for one year

GENERAL KNOWLEDGE - VEHICLE INSPECTIONS

PRE-TRIP INSPECTION

What to Look For during Pre-Trip Inspection:

Tire Problems

- Too much or too little air pressure.
- Bad wear. **You need at least 4/32-inch tread depth in every major groove on front tires. You need 2/32 inch on other tires. No fabric should show through the tread or sidewall.**
- Cuts or other damage.
- Tread separation.
- **Dual tires that come in contact with each other or parts of the vehicle could cause a fire.**
- Radial and bias-ply tires used together or mismatched tire sizes.
- Cut or cracked valve stems.
- **Re grooved, recapped, or retreaded tires on the front wheels of a bus. These are prohibited.**

Wheel and Rim Problems

- Damaged rims.
- Rust around wheel nuts may mean the nuts are loose—check tightness. After a tire has been changed, stop a short while later and recheck tightness of nuts.
- Missing clamps, spacers, studs, or lugs means danger.
- Mismatched bent, or cracked lock rings are dangerous.
- Wheels or rims that have had welding repairs are not safe.
- **Wheel bearing seals should be checked for the hub oil level and be leak free.**

Bad Brake Drums or Shoes

- Cracked drums.
- Shoes or pads with oil, grease, or brake fluid on them.
- Shoes worn dangerously thin, missing, or broken.

Steering System Defects

- Missing nuts, bolts, cotter keys, or other parts.
- Bent, loose, or broken parts, such as steering column, steering gear box, or tie rods.
- If power steering equipped, check hoses, pumps, and fluid level; check for leaks.
- **Steering wheel play of more than 10 degrees (approximately 2 inches movement at the rim of a 20-inch steering wheel) can make it hard to steer.**

NOTES

Food for Thought:

What three kinds of emergency equipment must you have?

What is the minimum tread depth for front tires? For the other tires?

Why should you put your vehicle's key in your pocket during the pre-trip inspection?

What things should you check during a trip?

Safety Note:

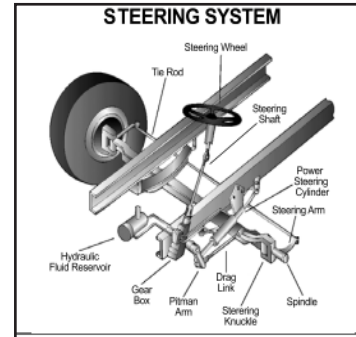
Put the starter switch key in your pocket during the pre-trip inspection for your own safety. That way no one can take the vehicle while you are inspecting it.

Study Note:

Words that appear in **bold type** have a practice question associated with them. There is also a high probability that there is a CDL test question on the topic. Pay particular attention to these items.

NOTES

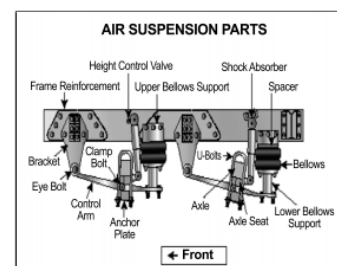
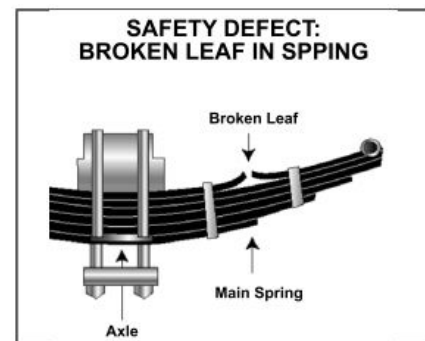
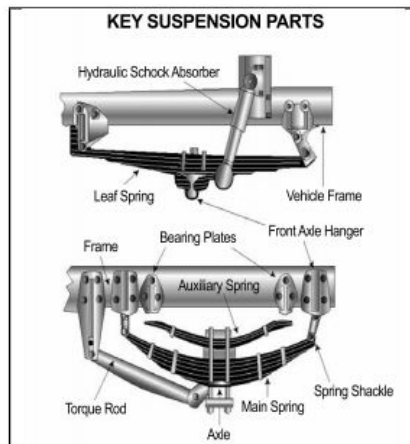
This figure illustrates a typical steering system.



Suspension System Defects

The suspension system holds up the vehicle and its load. It keeps the axles in place. Therefore, broken suspension parts can be extremely dangerous. Look for:

- Spring hangers that allow movement of axle from proper position.
- Cracked or broken spring hangers.
- Missing or broken leaves in any leaf spring. If one-fourth or more are missing, it will put the vehicle "out of service," but any defect could be dangerous.
- Broken leaves in a multi-leaf spring or leaves that have shifted so they might hit a tire or other part.
- Leaking shock absorbers.
- Torque rod or arm, u-bolts, spring hangers, or other axle positioning parts that are cracked, damaged, or missing.
- Air suspension systems that are damaged and/or leaking.
- Any loose, cracked, broken or missing frame members.



Exhaust System Defects

A broken exhaust system can let poison fumes into the cap or sleeper berth. Look for:

- Loose, broken, or missing exhaust pipes, mufflers, tailpipes, or vertical stacks.
- Loose, broken, or missing mounting brackets, clamps, bolts or nuts.
- Exhaust system parts rubbing against fuel system parts, tires or other moving parts of vehicle.
- Exhaust system parts that are leaking.

Emergency Equipment

Vehicles must be equipped with emergency equipment. Look for:

- Fire extinguisher(s).
- Spare electrical fuses (unless equipped with circuit breakers).
- Warning devices for parked vehicles (for example, three reflective warning triangles).

Cargo (Trucks)

You must make sure the truck is not overloaded and the cargo is balanced and secured before each trip. If the cargo contains hazardous materials, you must inspect for proper papers and placarding.

- Cracked drums.
- Shoes or pads with oil, grease, or brake fluid on them.
- Shoes worn dangerously thin, missing, or broken.

Vehicle Inspection Guide

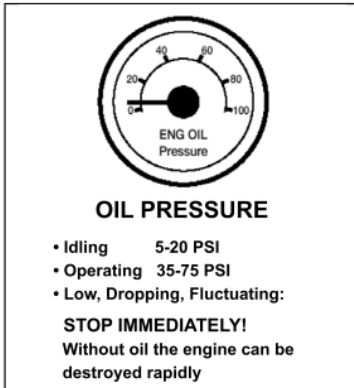
Method of Inspection

You should do a pre-trip inspection the same way each time so you will learn all the steps and become less likely to forget something.

Approaching the Vehicle

Notice general condition. Look for damage or vehicle leaning to one side. Look under the vehicle for fresh oil, coolant, grease or fuel leaks. Check the area around the vehicle for hazards to vehicle movement (people, other vehicles, objects, low hanging wires, limbs, etc.).

NOTES



SEVEN-STEP INSPECTION METHOD

Step 1: Vehicle Overview

- Review the last vehicle inspection report.

Step 2: Check Engine Compartment

- Check that parking brakes are on and/or wheels chocked

Step 3: Start Engine and Inspect Inside of Cab

- Look at the gauges
- Check condition of controls
- Check mirrors and windshield
- Check emergency equipment

Step 4: Turn off Engine and Check Lights

Step 5: Do Walk-Around Inspection

- Go to front of vehicle and check that low beams are on and both of the four-way flashers are working.
- Push dimmer switch and check that high beams work.
- Turn off headlights and four-way emergency flashers.
- Turn on parking, clearance, side-market, and identification lights.
- Turn on right turn signal, and start walk-around inspection.

Walk Around Inspection: General

- Walk around and inspect.
- Clean all lights, reflectors, and glass as you go along.

Left Front Side

- Driver's door glass should be clean.
- Door latches or locks should work properly.
- Left front wheel.
- Condition of wheel and rim, missing, bent, broken studs, clamps, lugs, or any signs of misalignment.
- Condition of tires - properly inflated, valve stem and cap OK, no serious cuts, bulges, or tread wear.
- Use wrench to test rust-streaked lug nuts, indicated looseness.
- Hub oil level OK, no leaks.
- Left front suspension.
- Condition of spring, spring hangers, shackles, u-bolts.
- Shock absorber condition.
- Left front brake.
- Condition of brake drum or disc.
- Condition of hoses.

Front

- Condition of front axle.
- Condition of steering system.
- No loose, worn, bent, damaged or missing parts.
- Must grasp steering mechanism to test for looseness.
- Condition of windshield.
- Check for damage and clean if dirty.
- Check windshield wiper arms for proper spring tension.
- Check wiper blades for damage, stiff rubber and securement.
- Lights and reflectors.
- Parking, clearance, and identification lights clean, operating, and proper color (amber at front).
- Reflectors clean and proper color (amber at front).
- Right front turn signal clean, operating, and proper color (amber or white on signals facing forward).

Right Side

Right front: check all items as done on left front.

- Primary and secondary safety cab locks engaged (if cab-over-engine design).
- Right fuel tank(s).
- Securely mounted, not damaged, or leaking.
- Fuel crossover line secure.
- Tank(s) contain enough fuel.
- Cap(s) on and secure.
- Condition of visible parts.
- Rear of engine - not leaking.
- Transmission - not leaking.
- Exhaust system - secure, not leaking, not touching wires, fuel or air lines.
- Frame and cross members - no bends or cracks.
- Air lines and electrical wiring - secured against snagging, rubbing, wearing.
- Spare tire carrier or rack not damaged (if so equipped).
- Spare tire and/or wheel securely mounted in rack.
- Spare tire and wheel adequate (proper size, inflated).
- Cargo securement (trucks).
- Cargo properly blocked, braced, tied, chained, etc.
- Header board adequate, secure (if required).
- Side boards, stakes strong enough, free of damage, properly set in place (if so equipped).
- Canvas or tarp (if required) properly secured to prevent tearing, billowing, or blocking of mirrors.
- If oversize, all required signs (flags, lamps, reflectors) safely and properly mounted and all required permits in driver's possession.
- Curbside cargo compartment doors in good condition, securely closed, latched/locked and required security seals in place.

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Right Rear

- Condition of wheels and rims, no missing, bent, or broken spacers, studs, clamps, or lugs.
- Condition of tires - properly inflated, valve stems and caps OK, no serious cuts, bulges, tread wear, tires not rubbing each other, and nothing stuck between them.
- Tires same type, e.g., not mixed radial and bias types.
- Tires evenly matched (same sizes).
- Wheel bearing/seals not leaking.
- Suspension.
- Condition of spring(s) spring hangers, shackles and u-bolts.
- Axle secure.
- Powered axle(s) not leaking lube (gear oil).
- Condition of torque rod arms, bushings.
- If retractable axle equipped, check condition of lift mechanism. If air powered, check for leaks.
- Condition of air ride components.
- Brakes.
- Brake adjustment.
- Condition of brake drum(s) or discs.
- Condition of hoses - look for any wear due to rubbing.
- Lights and reflectors.
- Side-marker lights clean, operating, and proper color (red at rear, others amber).
- Side-marker reflectors clean and proper color (red at rear, others amber).

Rear

- Rear clearance and identification lights clean, operating and proper color (red at rear).
- Reflectors clean and proper color (red at rear).
- Taillights clean, operating and proper color (red at rear).
- Right rear turn signal operating, and proper color (red, yellow, or amber at rear).
- License plate(s) present, clean, and secured.
- Splash guards present, not damaged, properly fastened, not dragging on ground, or rubbing tires.
- Cargo secure (trucks) - Cargo properly blocked, braced, tied, chained, etc.
- Tailboards up and properly secured.
- End gates free of damage, properly secured in stake sockets.
- Canvas or tarp (if required) properly secured to prevent tearing, billowing, or blocking either the rear view mirrors or rear lights.
- If over-length or width, make sure all signs and/or additional lights/flags are safely and properly mounted and all required permits are in driver's possession.
- Rear doors securely closed, latched/locked.

Left Side

- Check all items as done on right side, plus:
- Battery(ies) - if not mounted in engine compartment.
- Battery box(es) securely mounted to vehicle.
- Box has secure cover.
- Battery(ies) secured against movement.
- Battery(ies) not broken or leaking.
- Fluid in battery(ies) at proper level (except maintenance-free type).
- Cell caps present and securely tightened (except maintenance-free type).
- Vents in cell caps free of foreign material (except maintenance-free type).

Step 6: Check Signal Lights

- Review the last vehicle inspection report.

Step 7: Start Engine and Check

- Test for hydraulic leaks
- Brake system
- Test parking brake

VEHICLE INSPECTIONS QUIZ

1. What sort of things should you inspect during a trip?
 - a. Gauges, exhaust, lights, cargo and coupling devices.
 - b. Gauges, brakes, lights, pumps and hoses.
 - c. Gauges, brakes, lights, cargo and coupling devices.
 - d. Gauges, tires, shock absorbers, brake shoes and frame members.

2. How do you test hydraulic brakes for leaks?
 - a. Move the vehicle slowly to see if it stops when the brake is applied.
 - b. Measure the free play in the pedal with a ruler.
 - c. With the vehicle stopped, pump the pedal three times, apply firm pressure, then hold down pedal and see if pedal moves.
 - d. Step on the brake pedal and the accelerator at the same time to see if the vehicle moves.

3. Which of these pieces of emergency equipment should be carried at all times in your vehicle?
 - a. Fire extinguisher(s)
 - b. Spare electrical fuses
 - c. Warning reflectors for parked vehicles
 - d. All the above

4. When checking your vehicle during the pre-trip inspection, which of these statements is true?
 - a. Rust around the wheel nuts may mean that they are loose.
 - b. Wheels or rims which have cracks welded are ok to use if they have been checked by the maintenance department.
 - c. A vehicle can be safely driven with one missing lug nut on a wheel.
 - d. Mismatched lock rings can be used on the same vehicle.

VEHICLE INSPECTIONS QUIZ

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5. You are checking your steering and exhaust system for a pre-trip inspection. Which of these statements is true?

- a. Steering wheel play of more than 10 degrees (2 inches on a 20-inch steering wheel) can make it hard to steer.
- b. Leaks in the exhaust system are not a problem if they are outside the cab.
- c. Some leakage of power steering fluid is normal.
- d. All of the above are true.

6. How many warning triangles are you required to carry in your vehicle?

- a. 1
- b. 2
- c. 3
- d. 4

NOTES

Food for Thought:

Why should you back toward the driver's side?

What are the two special conditions where you should downshift?

If stopped on a hill, how can you start moving without rolling back?

Retarders keep you from skidding when the road is slippery. T or F?

What are the two ways to know when to shift?

GENERAL KNOWLEDGE - DRIVING SAFELY PART I CONTROLLING YOUR VEHICLE

Basic Control of Your Vehicle

Accelerating

If you are **sitting on an incline**, don't let the bus roll back when you start up. If your bus has a manual transmission, partially engage the clutch before you take your right foot off the brake. Put on the parking brake, if necessary, to hold you in place while taking your foot off the brake. Then step gently on the accelerator to generate enough power to keep you from rolling backward. Then release the parking brake or the foot brake to proceed.

Steering

Hold the steering wheel firmly with both hands. **Your hands should be on opposite sides of the wheel.**

Backing Safely

Backing toward the right side is dangerous.

There are always blind spots you can't see, so if possible, enlist the aid of a helper. The most important hand signal will be the one for **"stop."**

Shifting Gears

There are two ways to know when to shift up:

1. Use Engine Speed - RPMs
2. Use Road Speed - MPH

Special conditions where you should downshift:

- **Before starting down a hill.** Make sure you downshift to a gear lower than the gear required to climb the same hill.
- **Before entering a curve.**
- **When going up a hill.**

Turn the retarder off whenever the road is wet, icy or snow covered.

CONTROLLING YOUR VEHICLE QUIZ

1. To avoid rollbacks when you start, you should:
 - a. Stop on a flat area
 - b. Engage the clutch very quickly
 - c. Press the accelerator
 - d. Partly engage the clutch before you take your right foot off the brake

2. What is the proper way to hold the steering wheel?
 - a. Firmly with both hands on opposite sides of the wheel
 - b. With your right hand on the wheel
 - c. Firmly with one hand at the top of the wheel and the other at the bottom
 - d. Holding it anywhere as long as you have a good grip

3. When backing and turning, you should:
 - a. Back and turn toward the driver's side.
 - b. Use a helper if possible.
 - c. Check your path before you begin backing.
 - d. All of the above

4. When using a helper to back up, what is the most important hand signal?
 - a. Slow down
 - b. Pull forward
 - c. Come straight back
 - d. Stop

5. When should a driver consider turning off a retarder system on the vehicle?
 - a. During wet and icy road conditions.
 - b. When driving through mountainous areas.
 - c. When roads are clear and dry.
 - d. Drivers are not able to turn off the retarder system.

6. Which of these statements about downshifting is true?
 - a. When you downshift for a curve, do so before you enter the curve.
 - b. When you downshift for a hill, do so after you start down the hill.
 - c. When you downshift for a curve, do so after you enter the curve.
 - d. When you downshift for a curve, do so just after the curve.

7. When you are on top of a hill and know you will be going down a steep grade, which statement is true?
 - a. Never downshift until you are going down a grade
 - b. Before starting the grade, always downshift to a gear lower than you used coming up the hill.
 - c. Put vehicle in neutral while going down a grade and use very heavy pressure on the brake pedal.
 - d. Use a steady brake pressure before going down the grade.

NOTES

NOTES

Food for Thought:

To give you enough time to react, how far ahead should you look while driving?

Where should you place your reflectors when stopped on a divided highway?

What is the proper way of using your mirrors when you're driving?

List three reasons to go right when avoiding a hazard.

What are three good rules for using turn signals?

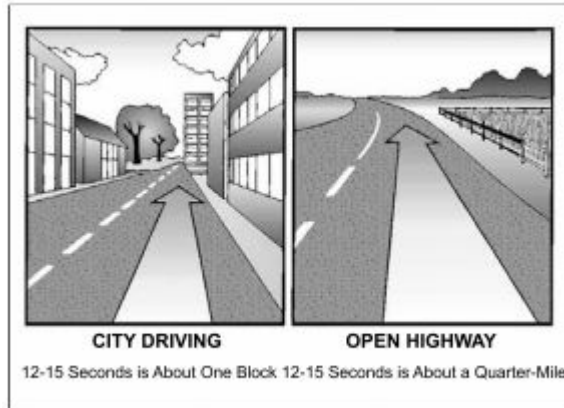
What does "communicating" mean in safe driving?

SEEING AND COMMUNICATING

Seeing

Seeing Ahead

Most good drivers **look 12 to 15 seconds** ahead of their vehicles. At lower speeds, that's about one city block. At highway speeds it's about a quarter of a mile.



The two main things you should look for ahead for are **traffic and road conditions**.

Seeing to the Sides and Rear

Check your mirrors regularly. Look back and forth between the mirrors and the road ahead. Use your mirrors to periodically check the condition of your tires and cargo.

Seeing Hazards

What is a Hazard?

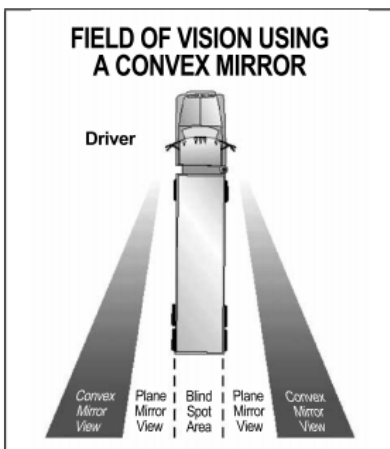
A hazard is any road condition or other road user that is a possible danger.

Types of Hazards - Hazardous Roads

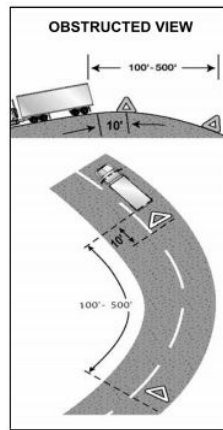
- Work Zones
- Drop Offs (near edge of the road)
- Foreign objects (Go around them)
- Off ramps and on ramps

Types of Hazards - Hazardous Drivers

- Blocked vision
- Delivery trucks
- Parked vehicles
- Pedestrians & Bicyclists
- Distractions
- Children



- Talkers
- Workers
- Disabled Vehicles
- Accidents
- Shoppers
- Confused Drivers
- Slow Drivers
- Drivers signaling a turn
- Drivers in a hurry
- Vehicle conflicts



NOTES

If you must steer around an obstacle, **go right instead of left**, if you can. Here are **three reasons to go right**:

1. Taking the shoulder may be best
2. Someone may be passing you to your left
3. You avoid the chances of a head-on collision

Communicating

Communicating in safe driving means **letting other drivers know you're there to help prevent accidents.**

When making a turn, there are three good rules for using turn signals:

- **Signal early**, well before your turn
- **Signal continuously** until you have completed the turn
- **Cancel your signal** after you have turned

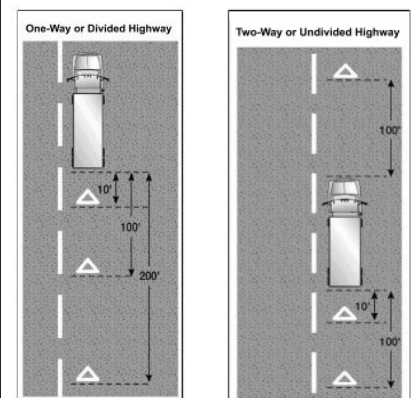
At dawn or dusk or in rain or snow, turn on your **low beam headlights.**

Placing Reflectors When Stopped

If you must stop on or by a **one-way or divided highway**, place warning reflectors **10 feet, 100 feet, and 200 feet toward the approaching traffic.**

If you stop on a **two-lane road** carrying traffic in both directions or on an **undivided highway**, place warning reflectors within **10 feet of the front or rear corners** to mark the location of the vehicle and **100 feet behind and ahead of the vehicle**, on the shoulder or in the lane you stopped in.

Remember, each commercial vehicle is required to carry **three warning triangles.**



SEEING AND COMMUNICATING QUIZ

1. How far should a driver look ahead of the vehicle while driving?
 - a. 6-9 seconds
 - b. 9-12 seconds
 - c. 12-15 seconds
 - d. 18-21 seconds

2. Use your mirrors to check:
 - a. The condition of your tires and cargo.
 - b. Where the rear of your vehicle is tracking while turning.
 - c. Traffic gaps before you merge.
 - d. All of the above.

3. While driving, you see a small cardboard box ahead of you in your lane. The box is about one foot square. You should:
 - a. Stop and direct traffic around it.
 - b. Stop and see if it is something valuable.
 - c. Hit it with your vehicle to knock it off the road.
 - d. Steer around it when it is safe to do so.

4. What are the three rules for using your turn signals?
 - a. 1) Signal when changing lanes, 2) Signal when turning corners, 3) Make sure the signal turns off after the turn is completed.
 - b. 1) Signal early, 2) Signal continuously, 3) Make sure the signal turns off after the turn is completed.
 - c. 1) Signal when changing lanes, 2) Signal when turning corners, 3) Use arm signals only when it's raining.
 - d. All of the above

5. When an emergency requires that you park on the side of a level, straight, two-lane road, where should you place the three reflective triangles?
 - a. One within 10 feet of the rear of the vehicle, one about 100 feet to the rear and one about 200 feet to the rear.
 - b. One within 10 feet of the rear of the vehicle, one about 100 feet to the rear and one about 100 feet from the front of the vehicle.
 - c. One about 50 feet from the rear of the vehicle, one about 100 feet to the rear and one about 100 feet from the front of the vehicle.

6. Which of these statements about marking a stopped vehicle is true?
 - a. If a hill or curve keeps oncoming drivers from seeing the vehicle within 500 feet, the rear reflective triangle should be moved back down the road to give adequate warning.
 - b. You do not need to put out reflective triangles unless the vehicle will be stopped for 30 minutes or more.
 - c. The vehicle's taillights should be kept on to warn other drivers.
 - d. All of the above are true.

DISTRACTED DRIVING

Distracted Driving

Distracted driving can result when you perform any activity that may shift your full attention from the driving task.

Using In-vehicle Communication Equipment safely:

- When possible, pull off the road when making or receiving a phone call.
- If possible, turn the cell phone off.
- Position the cell phone within easy reach.
- Program cell phones with commonly called numbers.
- If you have to place a call, find a safe place to pull off the road. Do not place a call while driving.
- Some jurisdictions require that only hands-free devices can be used while driving. Even these devices are unsafe to use when you are moving down the road.
- If you must use your cell phone, keep conversations short. Develop ways to get free of long-winded friends and associates while on the road. Never use the cell phone for social visiting.
- Hang up in tricky traffic situations.
- Do not use the equipment when approaching locations with heavy traffic, road construction, heavy pedestrian traffic, or severe weather conditions.
- Do not attempt to type or read messages on your satellite system while driving.

Watch Out for Other Distracted Drivers

You need to be able to recognize other drivers who are engaged in any form of distracted driving. Watch for:

- Vehicles that may drift over the lane divider lines or within their own lane.
- Vehicles traveling at inconsistent speeds.
- Drivers who are preoccupied with maps, food, cigarettes, cell phones, or other objects.
- Drivers who appear to be involved in conversations with their passengers.

Aggressive driving is the act of operating a motor vehicle in a selfish, bold, or pushy manner, **without regard for the rights or safety of others.**

Road rage is operating a motor vehicle **with the intent of doing harm to others** or physically assaulting a driver or their vehicle.

NOTES

Food for Thought:

How do you recognize a distracted driver?

What are some tips to follow so you won't become a distracted driver?

How do you use in-vehicle communications equipment cautiously?

What is the difference between aggressive driving and road rage?

What should you do when confronted with an aggressive driver?

NOTES

Reducing Driver Stress

How you feel before you even start your vehicle has a lot to do with how stress will affect you while driving. Reduce your stress by:

- Listen to “easy listening” music.
- Give the drive your full attention. Don’t allow yourself to become distracted by talking on your cell phone, eating, etc.
- Be realistic about your travel time. Expect delays because of traffic, construction, or bad weather and make allowances.
- If you’re going to be later than you expected - deal with it. Take a deep breath and accept the delay.
- Give other drivers the benefit of the doubt. Try to imagine why he or she is driving that way. Whatever their reason, it has nothing to do with you.
- Slow down and keep your following distance reasonable.
- Don’t drive slowly in the left lane of traffic.
- Avoid gestures. Keep your hands on the wheel. Avoid making any gestures that might anger another driver, even seemingly harmless expressions of irritation like shaking your head.
- Be a cautious and courteous driver. If another driver seems eager to get in front of you, say, “Be my guest.” This response will soon become a habit and you won’t be as offended by other drivers’ actions.

When Confronted With an Aggressive Driver:

- First and foremost, make every attempt to get out of their way.
- Put your pride in the back seat. Do not challenge them by speeding up or attempting to hold-your-own in your travel lane.
- Avoid eye contact.
- Ignore gestures and refuse to react to them.
- Report aggressive drivers to the police the appropriate authorities by providing a vehicle description, license number, location and, if possible, direction of travel.
- If an aggressive driver is involved in a crash farther down the road, stop a safe distance from the crash scene, wait for the police to arrive, and report the driving behavior that you witnessed.

DISTRACTED DRIVING QUIZ

1. Which of the statements below is NOT a tip to follow to avoid becoming a distracted driver?
 - a. Adjust all mirrors for best all-round visibility before you start your trip
 - b. Don't attempt to read or write while you drive
 - c. Keep your maps out and handy so you can plan your route as you go
 - d. Avoid smoking, eating and drinking while you drive

2. Which of the statements below is NOT a sign of a distracted driver?
 - a. Vehicles that may drift over the lane divider lines
 - b. Vehicles traveling at inconsistent speeds.
 - c. Drivers who are preoccupied with maps, food, cigarettes, cell phones, or other objects.
 - d. Drivers who wear dark sunglasses

3. Aggressive driving is the act of operating a motor vehicle in a selfish, bold, or pushy manner, without regard for the rights or safety of others.
 - a. True
 - b. False

4. The difference between aggressive driving and road rage is one of intent: aggressive drivers intend to do harm to others or their vehicles.
 - a. True
 - b. False

5. What should you NOT do when confronted with an aggressive driver?
 - a. Don't let them get around you.
 - b. Avoid eye contact.
 - c. Ignore and don't react to gestures.
 - d. Report aggressive drivers to the police.

NOTES

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Food for Thought:

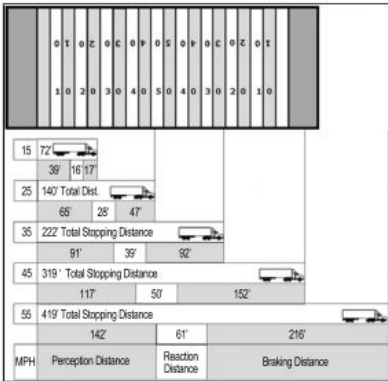
What three things add up to total stopping distance?

If you go twice as fast, will your stopping distance increase by two or four times?

Empty trucks have the best braking. True or False?

What is hydroplaning?

What is "black ice"?



CONTROLLING YOUR SPEED

Knowing How Quickly You Can Stop

Stopping distance is the sum of three things:

Perception Distance + Reaction Distance + Braking Distance

Perception distance is the distance your vehicle travels from the time your eyes see a hazard until your brain recognizes it.

Reaction distance is the distance traveled from the time your brain tells your foot to move until your foot is actually pushing the brake pedal.

Braking distance is the distance it takes to stop once the brakes are applied.

Total Stopping Distance

At 55 mph, it will take about six seconds to stop and your vehicle will travel about 290 feet.

When you double your speed, it takes about four times as much distance to stop.

Traction= Friction between the tires and the road.

Empty trucks require greater stopping distances, because an empty vehicle has less traction.

Black Ice is a thin layer of ice that is clear enough that you can see the road underneath it.

Match your speed to the road surface. **On packed snow, reduce your speed by 1/2 or more. Reduce your speed by about 1/3 on a wet road.**

Hydroplaning - Your tires lose their contact with the road and have little or no traction. **You can regain control by releasing the accelerator and pushing in the clutch.**

When you're driving in heavy traffic, **the safest speed is the speed of other vehicles.**

CONTROLLING YOUR SPEED QUIZ

1. Which of the following statements about speed management is true?
 - a. Empty trucks always stop in a shorter distance than loaded ones.
 - b. As the speed of a vehicle doubles, its stopping distance also doubles.
 - c. Choose a driving speed that lets you stop in the space that you can see ahead.
 - d. Following too closely is not a problem if the driver is alert.

2. What is black ice?
 - a. Dirty snow
 - b. Rain and snow mixed.
 - c. A thin layer of ice clear enough that you can see the road underneath it.
 - d. Frozen sewage

3. What should you do if your vehicle hydroplanes?
 - a. Start stab braking.
 - b. Downshift immediately.
 - c. Accelerate slightly.
 - d. Release the accelerator and push in the clutch.

4. What three things add up to total stopping distance?
 - a. Road conditions, reaction distance and braking distance.
 - b. Perception distance, reaction distance and braking distance
 - c. Braking distance controlling speed and reaction distance

5. For the average driver, driving at 55 mph on dry pavement, about what distance will it take to stop the vehicle?
 - a. The length of the vehicle.
 - b. Twice the length of the vehicle.
 - c. Twice the length of a football field.
 - d. The length of a football field.

NOTES

NOTES

Food for Thought:

How do you find out how many seconds of following distance space you have?

If you are driving a 30-foot vehicle at 55 mph, how many seconds of following distance should you allow?

Should you decrease your following distance if somebody is following you too closely?

If you swing wide to the left before turning right, another driver may try to pass you on the right. True or False?

MANAGING YOUR SPACE


While driving, you should look ahead and occasionally look to the sides to be sure you know what's going on around you.

The area ahead of the vehicle is the most important in case you must suddenly stop.


You need at least **one second for each 10 feet of your vehicle's length** at speeds below 40 MPH. At greater speeds, you must add one second for safety. Watch your space behind.

HEAVY VEHICLE FORMULA
For timed interval following distance


- 1 second required for each 10 feet of vehicle length at speeds under 40 MPH
- Above 40 MPH use same formula, then add 1 second for the additional speed



40 foot truck (under 40 MPH) = 4 seconds



50 foot truck (above 40 MPH) = 6 seconds



60 foot truck (under 40 MPH) = 6 seconds

If you find yourself being tailgated, here are some things you can do to reduce the chances of getting into an accident:

- **Avoid quick speed or lane changes.**
- **Increase your following distance** - the distance between you and the vehicle ahead.
- **Don't speed up** - let the tailgater pass you.
- **Avoid tricks** like flashing your brake lights.

Make sure you always have overhead clearance:

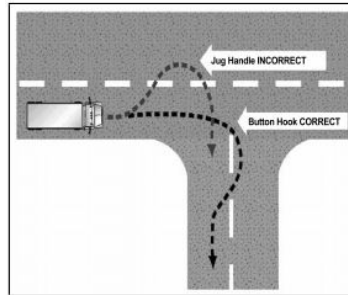
- **Don't assume** that the heights posted at bridges and overpasses are correct.
- The weight of a cargo **van changes its height.**
- If you doubt you have **safe space** to pass under an object, **go slowly.**
- Some roads can **cause a vehicle to tilt.**

Right Turns

Allow space for right-hand turns:

- Turn slowly.
- Turn wide as you enter the turn. Keep the rear of your vehicle close to the curb.
- **Don't swing wide to the left to make a right-hand turn.** A following driver may try to pass you on the right side of your vehicle.

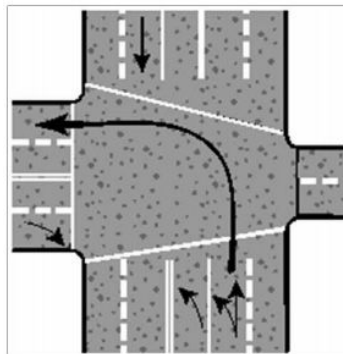
Making a Correct Right Turn:



Left Turns

Allow space for making left-hand turns. When making a left-hand turn, make sure you have reached the center of the intersection before you start the left turn. If there are two turning lanes, **always turn into the right-hand turn lane.**

Making a Correct Left Turn:



Space Needed to Cross or Enter Traffic

Be aware of the size and weight of your vehicle **when you cross or enter traffic.**

- You may need a **much larger gap** to enter traffic than you would in a car.
- **Allow more room** if your vehicle is heavily loaded.
- Before you start across a road, **make sure you can get all the way across** before traffic reaches you.

NOTES

MANAGING YOUR SPACE QUIZ

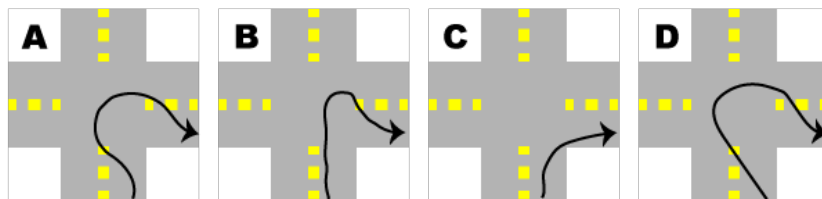
1. When looking ahead of your vehicle while driving you should:
 - a. Look straight ahead.
 - b. Look to the right side of the road.
 - c. Look to the left side of the road.
 - d. Look ahead and to the sides

2. If you are being tailgated, you should:
 - a. Turn on your taillights.
 - b. Increase the space in front of your vehicle.
 - c. Speed up.
 - d. Signal when it is safe to pass you.

3. You are driving a 40 foot vehicle at 45 mph. Conditions are ideal (dry pavement, good visibility). What is the least amount of space that you should keep in front of your vehicle to be safe?
 - a. 2 seconds.
 - b. 3 seconds.
 - c. 4 seconds.
 - d. 5 seconds.

4. Which of these statements about overhead clearance is correct?
 - a. You should assume posted clearance signs are correct and proceed at the posted speed limit.
 - b. A vehicle's clearance can change with the load carried.
 - c. If the road surface causes your vehicle to tilt toward the edge of the road, you should drive close to the shoulder.
 - d. Heavy vehicles can always fit under any clearance.

5. You wish to turn right from a two-lane street to another two-lane street. Your vehicle is so long that you must swing wide to make the turn. Which of these drawings show how the turn should be made?



GENERAL KNOWLEDGE - DRIVING SAFELY PART II HAZARDOUS CONDITIONS

Night Driving

Three factors affect safe driving at night: the driver, the roadway and the vehicle.

Driver Factors

Driver factors that affect night driving include problems caused by night vision, glare and driver fatigue. **If you are sleepy or drowsy, the only safe cure is to get off the road and get some sleep.**

Roadway Factors

At night, your headlights will usually be the main source of light for you to see and for others to see you. With low beams you can see ahead about 250 feet -with high beams, about 350-500 feet.

Use high beams when it is safe and legal to do so, **EXCEPT IN FOG**. Keep your speed slow enough that you can **stop within the range of your headlights**.

Vehicle Factors

Check your **windshield wiper antifreeze level**.

Water in the brakes can cause the brakes to be weak, to apply unevenly or to grab. This, in turn, can cause **wheel lockup, trailer jackknife or lack of braking power**.

Driving in Very Hot Weather

Check your tires. Air pressure increases with temperature. In hot weather, you need to inspect your tires more often. But if the pressure is too high, **do not let air out of a hot tire** or the pressure will be too low when the tires cool off.

- Check your engine oil
- Check your engine belts and hoses for wear.
- Check your engine coolant -A safety tip: **Never remove the radiator cap or any part of the pressurized system until the system has cooled.**

NOTES

Food for Thought:

You should use low beams whenever you can. True or False?

What should you do before you drive if you are drowsy?

What effects can wet brakes cause? How can you avoid these problems?

You should let air out of hot tires so the pressure goes back to normal. True or False?

You can safely remove the radiator cap as long as the engine isn't overheated. True or False?

HAZARDOUS CONDITIONS QUIZ

1. Which of these is a good practice to follow while driving at night?
 - a. Keep your speed slow enough so you can stop within the range of your headlights.
 - b. Look directly at oncoming headlights.
 - c. Wear sun glasses in order to cut glare.
 - d. Keep your instrument lights as bright as you can.

2. High beams should:
 - a. Never be used while the vehicle is on a public road.
 - b. Be used whenever it is wise and legal to do so.
 - c. Be turned on when an oncoming driver does not dim their lights
 - d. Be dimmed when you are within 100 feet of another vehicle.

3. Which of these will help keep an engine cool in hot weather?
 - a. Avoiding high-speed driving.
 - b. Keeping oil level in crankcase at the full mark.
 - c. Keeping proper amount of antifreeze in the radiator.
 - d. All of the above.

4. Your brakes may get wet when you drive through a heavy rain storm. What problems can this cause when the brakes are applied?
 - a. Wheel lockup
 - b. Trailer jackknife
 - c. Lack of braking power
 - d. All of the above.

5. Which of these statements about tires and hot weather driving is true?
 - a. You should inspect your tires more often because the air pressure is more likely to get too high.
 - b. If a tire is too hot to touch, you should drive on it to cool it off.
 - c. Recapped tires are less likely to fail in hot weather than new tires.
 - d. All of the above are true.

6. Which of these statements about winter driving is true?
 - a. There is no need to worry about engine overheating when the weather is very cold.
 - b. Exhaust system leaks are less dangerous in cold weather.
 - c. Wiper blades should be adjusted so that they do not make contact with the windshield.
 - d. Windshield wiper antifreeze should be added to the washer reservoir.

7. You should avoid driving through deep water, but if you must, which of these steps can help you keep your brakes working?
 - a. Adjust the brakes after coming out of the water.
 - b. Gently pressing the brake pedal while driving through the water.
 - c. Applying hard pressure on both the brake pedal and accelerator after coming out of the water.
 - d. Disconnecting the steering axle brakes after coming out of the water.

RAILROAD CROSSINGS AND MOUNTAINS

NOTES

Railroad Crossings

Types of Crossings

- Passive crossings do not have any type of traffic control device. The decision to stop or proceed rests entirely in your hands.
- Active crossings have a traffic control device installed at the crossing to regulate traffic at the crossing. These active devices include flashing red lights, with or without bells and crossing gates.

Warning Signals

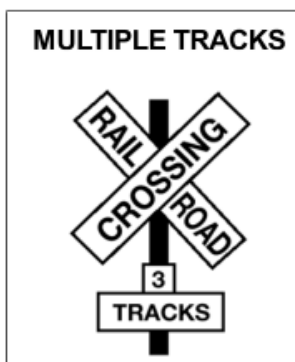
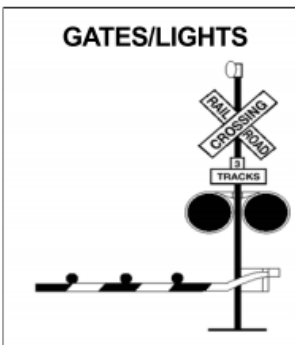
- Yellow Warning Sign
- Pavement Markings
- No Passing Zone Sign
- Cross buck Sign
- Flashing Red Light Signals

A **full stop** at a grade crossing is required by **all school buses**.

It takes a typical tractor-trailer unit at least **14 seconds to clear a single track** and more than **15 seconds to clear a double track**.

These trailers can get stuck on raised crossings:

- **Low slung units**
- Single-axle tractor pulling a long trailer with its **landing gear set** to accommodate a tandem axle tractor.



Food for Thought:

What factors determine your selection of a "safe" speed when going down a long, steep downgrade?

Why should you be in the proper gear before starting down a hill?

Describe the proper braking technique when going down a long, steep downgrade.

What is an "escape ramp"?

What type of vehicle can get stuck on a railroad crossing?

How long does it take for a typical tractor trailer unit to clear a double track?

NOTES

Mountains

Mountain Driving

When **going down a long steep grade**, these factors determine what speed is "safe":

- Total weight of the vehicle and cargo
- Length of the grade
- Steepness of the grade
- Road conditions
- Weather

You must **use the braking effect of the engine** as the principal way of controlling your speed when going down hills.

Shift the transmission to a low gear before starting down the grade.

With **older vehicles**, a rule for choosing gears is to **use the same gear going down a hill** that you would need to climb the hill.

Drivers of modern vehicles may have to use **lower gears going down a hill** than would be required to go up the hill.

The heavier a vehicle or the faster it is moving, **the more heat the brakes have to absorb to stop it.**

If your **brakes start to fade**, you may have to use an **escape ramp.**

The use of **brakes on downgrades** is only a supplement to the braking effect of the engine.

Proper Braking Technique:

- a. Apply the brakes just hard enough to feel a definite slowdown.
- b. When your speed has been reduced to approximately five mph below your "safe" speed, release the brakes. (This brake application should last for about 3 seconds.)
- c. When your speed has increased to your "safe" speed, repeat steps 1 and 2.

RAILROAD CROSSINGS AND MOUNTAINS QUIZ

NOTES

1. What type of vehicle can get stuck on a railroad crossing?
 - a. A heavier vehicle that is moving slowly.
 - b. Long or low slung units.
 - c. Tanker trailers.
 - d. All of the above.

2. Where do vehicles need to stop at a railroad crossing?
 - a. 50 ft from the nearest rail.
 - b. Behind the white painted line on the roadway.
 - c. Next to the crossbuck sign.
 - d. Next to the round yellow railroad sign.

3. Which of these statements about brakes is true?
 - a. The heavier a vehicle or the faster it is moving, the more heat the brakes have to absorb to stop it.
 - b. Brakes have more stopping power when they get very hot.
 - c. Brake drums cool very quickly.
 - d. All of the above are true.

4. You are traveling down a long, steep grade and your brakes begin to fade and then fail. What should you do?
 - a. Downshift quickly
 - b. Pump the brake pedal.
 - c. Look for an escape ramp or escape route.
 - d. All of the above.

5. You are driving a newer model truck with a manual transmission. What gear will you probably have to use to take a long downhill grade?
 - a. The same gear used to climb the hill.
 - b. A lower gear than was used to climb the hill.
 - c. A higher gear than was used to climb the hill.
 - d. None - newer trucks can coast down hills.

6. Describe the proper braking technique when going down a long, steep downgrade?
 - a. Apply the brake just hard enough to feel a definite slowdown
 - b. When your speed has been reduced to around 5mph below your "safe" speed, release the brake
 - c. When your speed has increased to your "safe" speed, repeat a and b
 - d. All of the above

NOTES

Food for Thought:

Stopping is not always the safest thing to do in an emergency. True or False?

If a tire blows out, you should put the brakes on hard to stop quickly. True or False?

What actions can you take in a traffic emergency situation?

After driving onto the shoulder, how do you get back on the roadway safely?

HANDLING EMERGENCIES

Driving Emergencies

Steering to Avoid a Crash

When steering to avoid a crash, take the following steps:

- Keep both hands on the steering wheel.
- Do not apply the brakes while you are turning.
- Do not turn more than you need. The more sharply you turn, the greater the risk of turning over or skidding.
- Be ready to countersteer as soon as you have passed whatever was in your path

Counter steering means turning your wheel in the opposite direction. If something is blocking your path, the best direction to steer will depend on the situation.

- If you have been using your mirrors, you'll know which lane is empty and can be safely used.
- If the shoulder is clear, **steering to the right is often the best answer in an emergency situation.**

Stopping Quickly and Safely

Stopping is not always the safest thing to do in an emergency. If you are forced to return to the road before you can stop, use the following procedure:

- Hold the wheel tightly and turn sharply enough to get right back on the road safely. Don't try to edge gradually back on the road. If you do, your tires might grab unexpectedly and you could lose control.
- When both front tires are on the paved surface, counter steer immediately. The two turns should be made as a single "steer counter steer" move.

Controlled Braking

- **Apply the brakes** as hard as you can without locking the wheels.
- **Steer as little as possible.**
- If you need to steer harder or if the wheels lock, release the brakes. Reapply the brakes as soon as possible

Stab Braking

- **Apply your brakes fully.**
- Release the brakes **when the wheels lock up.**
- As soon as the wheels start rolling, **apply the brakes fully again.** It can take up to one second for the wheels to start rolling after you release the brakes. If you reapply the brakes before the wheels start rolling, the vehicle will not straighten out.

Use stab braking only on vehicles that do not have an anti-lock braking system.

Brake Failure

In the event of brake failure:

- **Downshift**
- **Pump the brakes**
- **Use the parking brake**
- **Look for an escape route or ramp**

Tire Failure

In the event of tire failure:

- **Hold the steering wheel firmly**
- **Stay off the brakes**
- **Check the tires after you stop**

Causes of Skidding

- **Overbraking**
- **Oversteering**
- **Overacceleration**
- **Driving too fast**

Rear-wheel Skids

Stopping rear wheel skids caused by overacceleration:

- **Take your foot off the accelerator**
- **Push in the clutch**

In a rear-braking skid, a bus or straight truck will slide sideways. A vehicle towing a trailer will jackknife.

Stopping rear wheel skids caused by overbraking:

- **Stop braking**
- **Turn quickly** if your vehicle starts to slide. **Steer in the direction you want to go.**
- **Counter steer.** As soon as your vehicle begins to move in the correct direction, turn the steering wheel quickly in the opposite direction. This will prevent a skid in the opposite direction

Front-wheel Skids

In a front-wheel skid, the front of the vehicle **continues in a straight line** no matter how much you turn the steering wheel.

Stopping front-wheel skids:

- **Stop turning and braking as hard**
- **Slow down** as quickly as possible without skidding

HANDLING EMERGENCIES QUIZ

1. Which of these is a good rule to follow when steering to avoid a crash?
 - a. Apply the brakes while turning.
 - b. Steer with one hand so you can turn the wheel more quickly.
 - c. Do not turn any more than needed to clear what is in your way.
 - d. Avoid counter steering.

2. Controlled braking is:
 - a. Used when you are turning sharply.
 - b. Locking the wheels for short periods of time.
 - c. Used to keep a vehicle from skidding.
 - d. All of the above.

3. Your vehicle has hydraulic brakes. While traveling on a level road, the system loses pressure and the brakes fail. Which of these statements is true?
 - a. You should not downshift if you have an automatic transmission.
 - b. Pumping the brake pedal may bring the pressure up so you can stop the vehicle.
 - c. The parking brake will not work either because it is part of the same hydraulic system.
 - d. All of the above.

4. You are driving in the right lane of a four-lane, undivided road. You come over the crest of a hill and find a car stopped ahead in your lane. You do not have room to stop, and the hill blocks your view from the rear. Which of these is the best action to take?
 - a. Steer into the left lane, apply hard brakes.
 - b. Steer onto the left shoulder.
 - c. Steer to the right.
 - d. Use hard braking and brace for collision.

5. The most common cause of serious vehicle skids is:
 - a. Driving too fast for road conditions.
 - b. Poorly adjusted brakes.
 - c. Bad tires.
 - d. Poorly designed roads.

6. To correct a rear-wheel braking skid, you should:
 - a. Apply more pressure to the brake pedal.
 - b. Apply more pressure to the brake pedal and steer / countersteer.
 - c. Release the brakes and accelerate.
 - d. Release the brakes and steer / countersteer.

7. If a straight vehicle truck or bus goes into a front wheel skid, it will:
 - a. Slide sideways or spin out.
 - b. Go straight ahead but will turn if you turn the steering wheel
 - c. Go straight ahead even if the steering wheel is turned.
 - d. Always slide to the right.

8. How do you correct a rear-wheel acceleration skid?
 - a. Increase acceleration to the wheels
 - b. Downshift
 - c. Apply the brakes
 - d. Stop accelerating and release the clutch

ABS, ACCIDENTS AND FIRES

Antilock Braking Systems (ABS)

If your ABS stops working, drive normally, but get the system serviced soon.

Safety Reminders

- ABS won't allow you to drive faster, follow more closely, or drive less carefully.
- ABS won't prevent power or turning skids-ABS should prevent brake-induced skids or jackknives, but not those caused by spinning the drive wheels or going too fast in a turn.
- ABS won't necessarily shorten stopping distance. ABS will help maintain vehicle control, but not always shorten stopping distance.
- ABS won't increase or decrease ultimate stopping power-ABS is an "add-on" to your normal brakes, not a replacement for them.
- ABS won't change the way you normally brake. Under normal brake conditions, your vehicle will stop as it always stopped.
- ABS only comes into play when a wheel would normally have locked up because of overbraking.
- ABS won't compensate for bad brakes or poor brake maintenance. Remember: The best vehicle safety feature is still a safe driver .
- Remember: Drive so you never need to use your ABS.
- Remember: If you need it, ABS could help to prevent a serious crash.

Accident Procedures

The basic steps to be taken at any accident are to:

- **Protect the area**
- **Notify authorities**
- **Care for the injured**

Protect the Area

To protect the accident area:

- If your vehicle is involved in the accident, try to get it to the side of the road.
- If you're stopping to help, park away from the accident.
- Put on your flashers.
- Set out reflective triangles to warn other traffic.

Notify Authorities

If you have a cell phone or CB, call for assistance before you get out of your vehicle.

NOTES

Food for Thought:

How do you know if your vehicle has antilock brakes?

What is the proper braking technique when driving a vehicle with antilock brakes?

How do antilock brakes help you?

What are some things to do at an accident scene to prevent another accident?

Name two causes of tire fires.

What kinds of fires is a B:C extinguisher good for?

When using your extinguisher, how close should you get to a fire?

NOTES

Care for the Injured

Do the best you can to help any injured parties:

- Don't move a severely injured person unless the danger of fire or passing traffic makes it necessary.
- Stop heavy bleeding by applying direct pressure to the wound.
- Keep the injured person warm.

Notify Authorities

If you have a cell phone or CB, call for assistance before you get out of your vehicle.

CLASS/TYPE OF FIRES	
Class	Type
A	Wood, Paper, Ordinary Combustibles Extinguish by Cooling and Quenching Using Water or Dry Chemicals
B	Gasoline, Oil, Grease, Other Greasy Liquids Extinguish by Smothering, Cooling or Heat Shielding using Carbon Dioxide or Dry Chemicals
C	Electrical Equipment Fires Extinguish with Nonconducting Agents such as Carbon Dioxide or Dry Chemicals. Do Not Use Water.
D	Fires in Combustible Metals Extinguish by Using Specialized Extinguishing Powders

Fires

Causes of Vehicle Fire

- Spilled fuel or the improper use of flares after accidents.
- Tires sometimes cause fires, in particular, **under-inflated tires and duals that touch.**
- Short circuits in the electrical system.
- Fuel-related fires are the result of driver smoking, improper fueling, or loose fuel connections.
- Cargo can be a cause of trailer fires.

In case of fire:

- **Pull off the road** (but don't pull into a gas station!)
- **Keep the fire from spreading** - keep the hood and trailer doors closed.
- **Extinguish the fire**

Extinguishing the fire:

Here are some rules to follow in putting out a fire:

- When using the extinguisher, **stay as far away from the fire as possible.**
- **Aim at the source or base of the fire, not up in the flames.**

Use the Correct Fire Extinguisher

- Know the type of fire extinguisher to use by class of fire.
- The B:C type fire extinguisher is designed to work on electrical fires and burning liquids.
- The A:B:C type is designed to work on burning wood, paper, and cloth as well.
- Water can be used on wood, paper, or cloth, but don't use water on an electrical fire (can cause shock) or a gasoline fire (it will spread the flames).
- A burning tire must be cooled. Lots of water may be required.
- If you're not sure what to use, especially on a hazardous materials fire, wait for firefighters.
- Position yourself upwind. Let the wind carry the extinguisher to the fire.
- Continue until whatever was burning has been cooled. Absence of smoke or flame does not mean the fire cannot restart.

CLASS OF FIRE/TYPE OF EXTINGUISHER	
<i>Class of Fire</i>	<i>Fire Extinguisher Type</i>
B or C	Regular Dry Chemical
A, B, C, or D	Multi-Purpose Dry Chemical
D	Purple K Dry Chemical
B or C	KCL Dry Chemical
D	Dry Powder Special Compound
B or C	Carbon Dioxide (Dry)
B or C	Halogenated Agent (Gas)
A	Water
A	Water With Anti-Freeze
A or B	Water, Loaded Stream Style
B, On Some A	Foam

ABS, ACCIDENTS, AND FIRES QUIZ

1. How should you brake in a vehicle with ABS brakes?
 - a. Pump the brakes in an emergency situation.
 - b. Apply the brakes as usual.
 - c. Apply the brakes but back off the brakes prior to the final stop.
 - d. Apply the brakes more firmly than usual.

2. What should you do if you have lost abs control at one or more wheels?
 - a. Call dispatch to report the problem.
 - b. Drive normally because you still have regular brakes but have the system serviced soon.
 - c. Drive faster so your ABS yellow malfunction lamp will go out.
 - d. None of the above.

3. Which of these is not a good practice when protecting an accident scene?
 - a. Do not move any of the involved vehicles off the road until law enforcement personnel arrive.
 - b. Put on your flashers.
 - c. Set out reflective triangles to warn other drivers.
 - d. If you're stopping to help, park away from the scene.

4. Which of these can cause a fire?
 - a. Under-inflated tires
 - b. Loose fuel connections
 - c. Electrical short circuits
 - d. All of the above

5. The first step to take if your vehicle catches fire while driving is:
 - a. Immediately open the door and jump out.
 - b. Head for the nearest service station.
 - c. Lift the hood to find out what's burning.
 - d. Get the vehicle off the road and stop in an open area.

6. On which fires can you use the "B:C" fire extinguisher?
 - a. Electrical fires
 - b. Burning liquids
 - c. Burning cloth
 - d. All of the above

7. Which of these statements about vehicle fires is true?
 - a. If cargo in a van or box trailer catches on fire, you should open the cargo doors as soon as you can.
 - b. If your engine is on fire, you should open the hood as soon as you can.
 - c. If a trailer is on fire, you should drive fast to put the flames out.
 - d. A burning tire must be cooled.

8. On which fires can you use water?
 - a. Tire fires
 - b. Gasoline fires
 - c. Electrical fires
 - d. All of the above

9. Which of these is a good rule to follow when using a fire extinguisher?
 - a. Keep as close to the fire as possible. Stay out of the way unless asked to assist.
 - b. Stay downwind of the fire.
 - c. Aim at the base of the fire.
 - d. All of the above.

NOTES

Food for Thought:
Common medicines for colds can make you sleepy. True or False?

What should you do if you become sleepy while driving?

Coffee and a little fresh air will help a drinker sober up. True or False?

What is "sleep debt"?

What are the danger signals of drowsy driving?

ALCOHOL AND DRUGS

Alcohol and Driving

The liver can only process one-third an ounce of alcohol per hour, which is considerably less than the alcohol in a standard drink. This is a fixed rate, so only time, not black coffee or a cold shower, will sober you up.

BAC (Blood Alcohol Content) is determined by:

- the amount of alcohol you drink - More alcohol means a higher BAC,
- how fast you drink - faster drinking means a higher BAC, and
- your weight - a small person doesn't have to drink as much to reach the same BAC.

WHAT IS A DRINK?									
It is the alcohol in drinks that affects human performance. It does not make any difference whether that alcohol comes from "a couple of beers," or from 2 glasses of wine, or 2 shots of hard liquor.									
Approximate Blood Alcohol Content									
Drinks	Body Weight in Pounds								Effects
	100	120	140	160	180	200	220	240	
0	.00	.00	.00	.00	.00	.00	.00	.00	Only Safe Driving Limit
1	.04	.03	.03	.02	.02	.02	.02	.02	Impairment Begins
2	.08	.06	.05	.05	.04	.04	.03	.03	Driving Skills Significantly Affected
3	.11	.09	.08	.07	.06	.06	.05	.05	Criminal Penalties
4	.15	.12	.11	.09	.08	.08	.07	.06	Criminal Penalties
5	.19	.16	.13	.12	.11	.09	.09	.08	
6	.23	.19	.16	.14	.13	.11	.10	.09	Legally Intoxicated Criminal Penalties
7	.26	.22	.19	.16	.15	.13	.12	.11	
8	.30	.25	.21	.19	.17	.15	.14	.13	Legally Intoxicated Criminal Penalties
9	.34	.28	.24	.21	.19	.17	.15	.14	
10	.38	.31	.27	.23	.21	.19	.17	.16	Legally Intoxicated Criminal Penalties

Subtract .01% for each 40 minutes of drinking. 1 drink is 1.5 oz. of 80 proof liquor, 12 oz. of beer, or 5 oz. of table wine.

EFFECTS OF INCREASING BLOOD ALCOHOL CONTENT		
Blood Alcohol Content is the amount of alcohol in your blood recorded in milligrams of alcohol per 100 milliliters of blood. Your BAC depends on the amount of blood (which increases with weight) and the amount of alcohol you consume over time (how fast you drink). The faster you drink, the higher your BAC, as the liver can only handle about 1 drink per hour—the rest builds up in your blood.		
BAC	Effects on Body	Effects on Driving Condition
.02	Mellow feeling, slight body warmth.	Less inhibited.
.05	Noticeable relaxation.	Less alert, less self-focused, coordination impairment begins.
.08	Definite impairment in coordination & judgment.	Drunk driving limit, impaired coordination & judgment.
.10*	Noisy, possible embarrassing behavior, mood swings.	Reduction in reaction time.
.15	Impaired balance & movement, clearly drunk.	Unable to drive.
.30	Many lose consciousness.	
.40	Most lose consciousness, some die.	
.50	Breathing stops, many die.	

*BAC of .10 means that 1/10 of 1% (or 1/1000) of your total blood content is alcohol.

Staying Alert and Fit to Drive

Get Enough Sleep

Sleep is not like money. You can't save it up ahead of time and you can't borrow it. You can't overcome sleep with willpower, and it won't go away by itself. The average person needs seven or eight hours of sleep every 24 hours. Leaving on a long trip when you're already tired is dangerous. If you have a long trip scheduled, make sure that you get enough sleep before you go.

Schedule Trips Safely

Try to arrange your schedule so you are not in "sleep debt" before a long trip. Your body gets used to sleeping during certain hours. If you are driving during those hours, you will be less alert. If possible, try to schedule trips for the hours you are normally awake. Many heavy motor vehicle accidents occur between midnight and 6 a.m. Tired drivers can easily fall asleep at these times, especially if they don't regularly drive at those hours. Trying to push on and finish a long trip at these times can be very dangerous.

Exercise Regularly

Resistance to fatigue and improved sleep are among the benefits of regular exercise. Try to incorporate exercise into your daily life. Instead of sitting and watching TV in your sleeper, walk or jog a few laps around the parking lot. A little bit of daily exercise will give you energy throughout the day.

Eat Healthy

It is often hard for drivers to find healthy food. But with a little extra effort, you can eat healthy, even on the road. Try to find restaurants with healthy, balanced meals. If you must eat at fast-food restaurants, pick low-fat items. Another simple way to reduce your caloric intake is to eliminate fattening snacks. Instead, try fruit or vegetables.

Avoid Medication

Many medicines can make you sleepy. Those that do, have a label warning against operating vehicles or machinery. The most common medicine of this type is an ordinary cold pill. If you have to drive with a cold, you are better off suffering from the cold than from the effects of the medicine.

Visit Your Doctor.

Regular checkups literally can be lifesavers. Illnesses such as diabetes, heart disease, and skin and colon cancer can be detected easily and treated if found in time. You should consult your physician or a local sleep disorder center if you suffer from frequent daytime sleepiness, have difficulty sleeping at night, take frequent naps, fall asleep at strange times, snore loudly, gasp and choke in your sleep, and/ or wake up feeling as though you have not had enough sleep.

ALCOHOL AND DRUGS QUIZ

1. Which of these can help you stay alert while driving?
 - a. Scheduling trips during hours that you are normally asleep
 - b. Taking a cold pill.
 - c. Keeping the cab warm.
 - d. Taking short breaks before you get drowsy.

2. Which of these statements about drugs is true?
 - a. A driver may use any prescription while driving.
 - b. Amphetamines ("pep pills" or "bennies") can be used to help the driver stay alert.
 - c. Use of drugs could lead to accidents and/ or arrest.
 - d. All of the above are true.

3. Which of these statements is true about staying alert when you drive?
 - a. A half-hour break for coffee will do more to keep you alert than a half-hour nap.
 - b. There are drugs that can overcome being tired.
 - c. If you must stop to take a nap, it can be done on the side of the road.
 - d. The only thing that can cure fatigue is sleep.

4. Which of the following is true about drinking alcohol?
 - a. Most people aren't affected by drinking.
 - b. A few beers have the same effect on driving as a few shots of whiskey.
 - c. Coffee and fresh air can sober a person up.
 - d. All of the above are true.

5. Which of these statements about drinking alcohol is accurate?
 - a. Alcohol first affects judgment and self-control, which are essential for safe driving.
 - b. Statistics show that drivers who have been drinking have a much greater chance of being in a collision.
 - c. A driver can lose his/her license for driving while under the influence of alcohol.
 - d. All of the above are true.

GENERAL KNOWLEDGE - CARGO AND HAZ-MAT TRANSPORTING CARGO SAFELY

Inspecting Cargo

Weight and Balance

You are responsible for:

- Recognizing overloaded or poorly balanced loads
- Securement of cargo
- Access to emergency equipment

Definitions You Should Know

- **Gross Vehicle Weight (GVW).** The total weight of a single vehicle plus its load.
- **Gross Combination Weight (GCW).** The total weight of a powered unit, plus trailer(s), plus the cargo.
- **Gross Vehicle Weight Rating (GVWR).** The maximum GVW specified by the manufacturer for a single vehicle plus its load.
- **Gross Combination Weight Rating (GCWR).** The maximum GCW specified by the manufacturer for a specific combination of vehicles plus its load.
- **Axle Weight.** The weight transmitted to the ground by one axle or one set of axles.
- **Tire Load.** The maximum safe weight a tire can carry at a specified pressure. This rating is stated on the side of each tire.
- **Suspension Systems.** Suspension systems have a manufacturer's weight capacity rating.
- **Coupling Device Capacity.** Coupling devices are rated for the maximum weight they can pull and/ or carry.
- **Legal Weight Limits.** You must keep weights within legal limits. States have maximums for GVWs, GCWs, and axle weights. You'll need to know the specific weight limits for your state.

Too little weight on the driving axles can cause poor traction and be too light to steer safely.

Cargo Tiedowns

Cargo should have at least one tiedown for each ten feet of cargo.

Cargo should be covered to protect people from spilled cargo; and to protect the cargo from weather.

NOTES

Food for Thought:

What four things related to cargo are drivers responsible for?

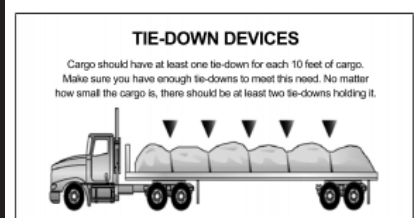
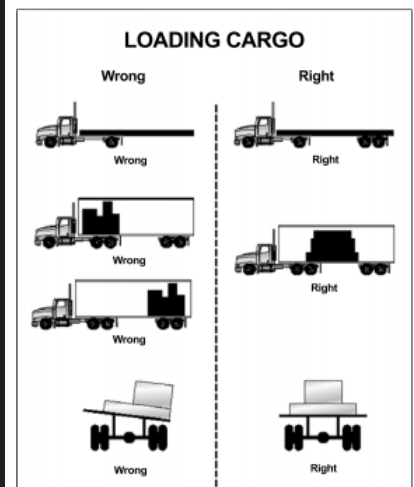
How often must you stop while on the road to check your cargo?

How is Gross Combination Weight Rating different from Gross Combination Weight?

What can happen if you don't have enough weight on the front axle?

What is the minimum number of tiedowns for a 20-foot load?

Name the two basic reasons for covering cargo on an open bed.



NOTES

TRANSPORTING CARGO QUIZ

1. Cargo that is not loaded or secured properly may cause problems. Which of these statements is true?
 - a. A vehicle could be damaged by overloading.
 - b. Other highway users can hit or be hit by loose cargo.
 - c. Cargo not secured properly can cause injury to the driver or to passengers during a quick stop, crash or emergency lane changes.
 - d. All of the above are true.

2. An en route inspection should include checking:
 - a. Cargo doors and/ or cargo securement.
 - b. Temperature.
 - c. Brake temperature.
 - d. All of the above.

3. The key factor in balancing cargo weight is to keep the load:
 - a. To the front.
 - b. To the rear.
 - c. On the side away from most traffic.
 - d. Centered in the cargo area of the vehicle.

4. Which of these statements about loading cargo is correct?
 - a. The legal maximum weight allowed by a state should be considered safe for all driving conditions.
 - b. Slight overloading of a vehicle can make its brakes work better.
 - c. If cargo is loaded by the shipper, the driver is not responsible for overloading.
 - d. State laws dictate legal weight limits.

5. A vehicle which is loaded with most of the weight on the steering axle will have:
 - a. Better handling.
 - b. A need to disconnect the steering axle brakes.
 - c. Too little traction on the steering axle.
 - d. Hard steering.

6. The center of gravity of a load:
 - a. Should be kept as high as possible.
 - b. Can make a vehicle more likely to tip over on curves.
 - c. Is only a problem if the vehicle is overloaded.
 - d. Makes no difference.

7. The regulations require that there should be at least one tiedown for every ____ feet of cargo.
 - a. 10
 - b. 15
 - c. 20
 - d. 25

HAZARDOUS MATERIALS

Haz-Mat

There are nine classes of hazardous materials.

Shipping papers related to hazardous materials must be tabbed or kept on top of other shipping papers in a commercial vehicle

You must also keep shipping papers:

- **In a pouch on the driver's door, or**
- **In clear view within reach while driving, or**
- **On the driver's seat when you're out of the vehicle.**

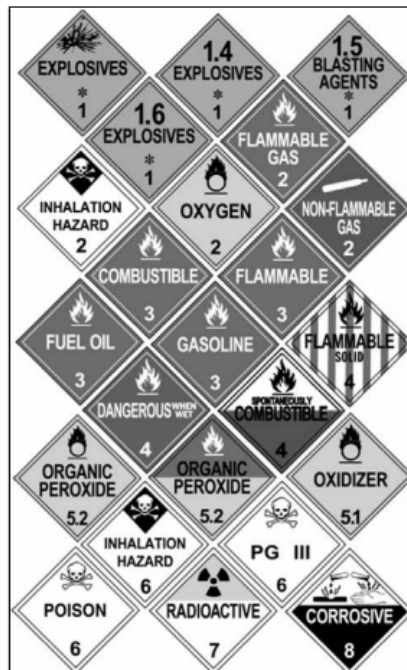
Placards

Placards are signs put on the outside of a vehicle that identify the hazard class of the cargo. They are used to warn others of hazardous materials.

A placarded vehicle must have at least four identical placards on the front, rear, and both sides. Placards must be readable from all four directions.

Placards are at least 10 3/4 inches square, turned upright on a point, in a diamond shape.

HAZARD CLASS DEFINITIONS		
Class	Class Name	Example
1	Explosives	Ammunition, Dynamite, Fireworks
2	Gases	Propane, Oxygen, Helium
3	Flammable	Gasoline Fuel, Acetone
4	Flammable Solids	Matches, Fuses
5	Oxidizers	Ammonium Nitrate, Hydrogen Peroxide
6	Poisons	Pesticides, Arsenic
7	Radioactive	Uranium, Plutonium
8	Corrosives	Hydrochloric Acid, Battery Acid
9	Miscellaneous Hazardous Materials	Formaldehyde, Asbestos
None	ORM-D (Other Regulated Material-Domestic)	Hair Spray or Charcoal
None	Combustible Liquids	Fuel Oils, Lighter Fluid



NOTES

Food for Thought:

What are hazardous materials?

What is a hazardous materials placard?

Why are placards used?

When can you legally carry hazardous materials without an endorsement on your commercial driver's license?

NOTES

HAZARDOUS MATERIALS QUIZ

1. You do not have a hazardous materials endorsement on your commercial driver's license. When can you legally haul hazardous materials?
 - a. Never.
 - b. Only when the vehicle does not require placards.
 - c. Only when the shipment will not cross state lines.
 - d. Only when an official from the department of transportation is present.

2. How many classes of hazardous materials are there?
 - a. 3
 - b. 6
 - c. 9
 - d. 12

3. Hazardous materials placards are:
 - a. Placed on the front, rear, and both sides of the vehicle.
 - b. 10 3 / 4 inches square
 - c. Turned upright on a point, in a diamond shape
 - d. All of the above.

4. What is a hazardous materials placard?
 - a. A deck of playing cards
 - b. Used to warn others of potential health problems
 - c. Used to let other drivers know which way you are driving
 - d. Signs put up on the outside of a vehicle that identify the hazard class of cargo.

PASSENGER ENDORSEMENT

TRANSPORTING PASSENGERS SAFELY

Passenger Endorsement Requirement

Bus drivers must have a commercial driver license if they drive a vehicle designed to seat more than 16 or more persons, including the driver. This definition may vary by state.

Vehicle Inspection

Vehicle Systems

Make sure these things are in good working order before driving:

- Service brakes, including air hose couplings (if your bus has a trailer)
- Parking brake
- Steering mechanism
- Lights and reflectors
- Tires (front wheels must not have recapped or regrooved tires)
- Horn
- Windshield wipers
- Rear-vision mirrors
- Wheels and rims
- Emergency equipment
- Close any open emergency exits or access panels.

Bus Interior

- **Aisles and stairwells should always be clear. There should be nothing in the aisle that might trip other riders.**
- **All seats must be securely fastened to the bus.**
- **Never drive with an open emergency exit door or window.**
- **The “Emergency Exit” sign must be visible and the light must work.**

Roof Hatches

Emergency roof hatches may be locked in a partly open position for fresh air, but do not leave them open as a regular practice.

The driver should **wear a seat belt at all times** when underway for safety.

Hazardous Materials

Buses may carry small-arms ammunition labeled ORM-D, emergency hospital supplies, and drugs. Buses can carry small amounts of some other hazardous materials if the shipper cannot send them any other way.

NOTES

Food for Thought:

Name some things to check in the interior of a bus during a pre-trip inspection.

What are some hazardous materials you can transport by bus?

What are some hazardous materials you can't transport by bus?

What is a standee line?

Does it matter where you make a disruptive passenger get off the bus?

How far from a railroad crossing should you stop?

When must you stop before crossing a draw bridge?

The rear door of a transit bus has to be open to put on the parking brake. True or False?

What are the “prohibited practices”?

NOTES

Forbidden Hazardous Materials

Buses must never carry:

- Division 2.3 poison gas, liquid Class 6 poison, tear gas, irritating material.
- More than 100 pounds of solid Class 6 poisons.
- Explosives in the space occupied by people, except small arms ammunition.
- Labeled radioactive materials in the space occupied by people.
- More than 100 pounds of any one class or
- More than 500 pounds total of allowed hazardous materials
- Riders may not carry on common hazards such as car batteries or gasoline.

Standee Line

Buses designed to allow standing must have a **two-inch line on the floor** or some other means of showing riders where they cannot stand.

- **Preventing Accidents**

Bus accidents often happen at intersections.

Excessive speed on curves causes crashes that kill people and destroy buses.

At Railroad Crossings:

- Stop your bus between 15 and 50 feet before the railroad crossing.
- Never change gears while crossing the tracks.

Drawbridges: Stop at least 50 feet before the draw of the bridge

Prohibited Practices

- Avoid fueling your bus with riders on board unless absolutely necessary. Never refuel in a closed building with riders on board.
- Don't talk with riders, or engage in any other distracting activity, while driving.
- Do not tow or push a disabled bus with riders aboard the vehicle, unless getting off would be unsafe.
- Do not use the brake and accelerator interlock system as a parking brake.

PASSENGER ENDORSEMENT QUIZ

1. If your bus is equipped with an emergency exit door, it must:
 - a. Be secured when the bus is being driven.
 - b. Always have a red door light turned on.
 - c. Not have any signs, stickers or markers near it.
 - d. All of the above.

2. When is it best to wear your seatbelt?
 - a. Only when you will be driving over 35 mph.
 - b. Only if required by company policy.
 - c. Only if your bus holds more than 27 people.
 - d. At all times.

3. How many seats not securely fastened to the bus are usually allowed?
 - a. 0
 - b. 1
 - c. 2
 - d. 3

4. When stopping for railroad tracks, you must stop no closer than how many feet before the nearest track?
 - a. 5
 - b. 10
 - c. 15
 - d. 20

5. You may sometimes haul small-arms ammunition, emergency drugs or hospital supplies on a bus. The total weight of all such hazardous material must not be greater than:
 - a. 100 pounds.
 - b. 250 pounds.
 - c. 500 pounds.
 - d. 750 pounds.

6. When you discharge an unruly passenger, you must choose a place that is:
 - a. Off the regular route.
 - b. Dark and poorly lighted.
 - c. As safe as possible, or the next stop.
 - d. The most convenient.

7. You must not allow riders to stand:
 - a. Between the wheel wells.
 - b. In front of the standee line.
 - c. Within two feet of an emergency exit.
 - d. Within two feet of any window.

8. Which of the following types of emergency equipment must you have on your bus?
 - a. Reflectors, fire extinguisher, accident reporting kit
 - b. Hydraulic jack, fire extinguisher, signal flares
 - c. Fire extinguisher, spare electrical fuses, reflectors
 - d. Spare electrical fuses, fire extinguisher, accident reporting kit

NOTES

NOTES

Food for Thought:
Define "Danger Zone".

Where are the blind spots around a bus?

What should you be able to see if the outside flat mirrors are adjusted properly?

What should you be able to see if the outside convex mirrors are adjusted properly?

What should you be able to see if the cross view mirrors are adjusted properly?

SCHOOL BUS ENDORSEMENT PART 1

Because state and local laws and regulations regulate so much of school transportation and school bus operations, many of the procedures in this section may differ from state to state. You should become thoroughly familiar with the laws and regulations in your state and local school.

DANGER ZONE / USING MIRRORS

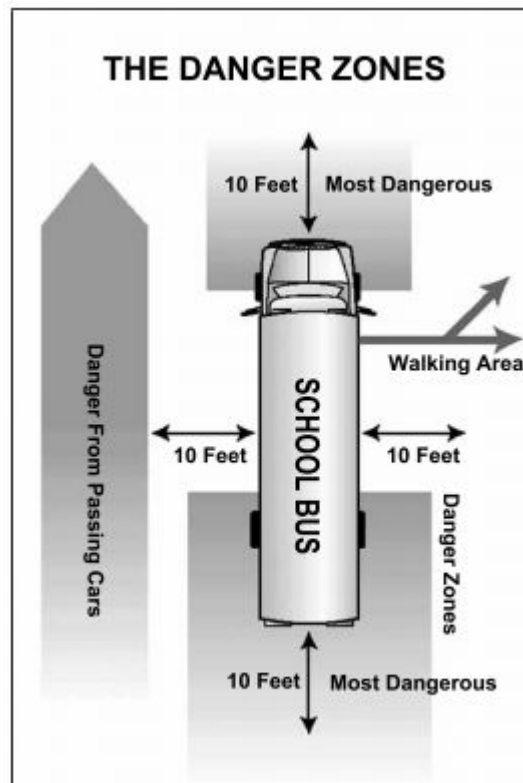
Danger Zone

Danger zones are areas outside the bus where children are in the most danger of being hit, either by another vehicle or their own bus.

The danger zones may extend as much as **30 feet from the front bumper, 10 feet from the left and right sides of the bus and 10 feet behind the rear bumper of the school bus.**

In addition, the area to the left of the bus is always considered dangerous because of passing cars.

NOTE: Different states, as well as the First Student driver training program, use different distances for danger zones. Ten feet is probably the most common distance. Check your state's school bus endorsement study manual to determine what the correct danger zone distance is.



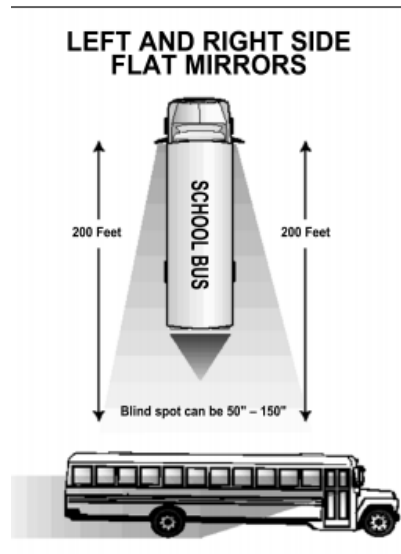
Correct Mirror Adjustment

Check each mirror before operating the school bus to obtain maximum viewing area.

Outside Left and Right Side Flat Mirrors

Ensure that the mirrors are properly adjusted so you can see:

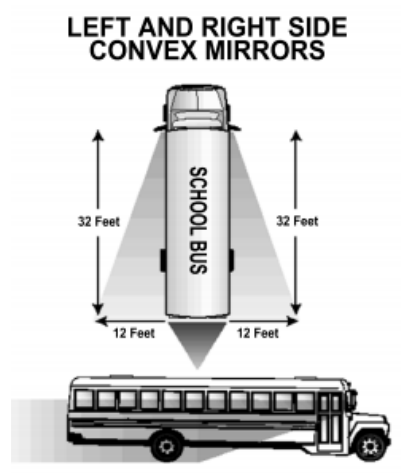
- 200 feet or 4 bus lengths behind the bus
- Along the sides of the bus
- The rear tires touching the ground



Outside Left and Right Side Convex Mirrors

You should position these mirrors to see:

- The entire side of the bus up to the mirror mounts
- Front of the rear tires touching the ground
- At least one traffic lane on either side of the bus

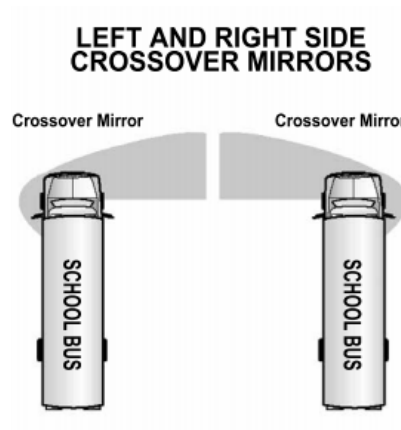


Outside Left and Right Side Crossover Mirrors

Ensure that the mirrors are properly adjusted so you can see:

- The entire area in front of the bus from the front bumper at ground level to a point where direct vision is possible.
- Direct vision and mirror view vision should overlap.
- The right and left front tires touching the ground.
- The area from the front of the bus to the service door.

These mirrors, along with the convex and flat mirrors, should be viewed in a logical sequence to ensure that a child or object is not in any of the danger zones



Overhead Inside Rearview Mirror

- You should position the mirror to see:
- The top of the rear window in the top of the mirror
- All of the students, including the heads of the students right behind you

School Bus Safety Considerations:

Backing

Post a lookout, preferably inside the school bus looking out the rear window

Signal for quiet on the bus.

Constantly check all mirrors and rear windows.

Back slowly and smoothly.

DANGER ZONE/MIRRORS QUIZ

1. Properly adjusted outside left and right side convex mirrors allow visibility in what area?
 - a. The entire side of the bus up to the front tires at ground level, in front of the rear tires touching the ground and at least one traffic lane on either side of the bus.
 - b. The area directly in front of the bus.
 - c. Front of the rear tires touching the ground, the entire side of the bus up to the mirror mounts, and at least one traffic lane on either side of the bus.

2. What is the value of the overhead inside rearview mirror?
 - a. It is used to provide visibility directly in back of the bus.
 - b. It is used to monitor passenger activity inside the bus.
 - c. It is used to monitor the driver's appearance.

3. Why is proper adjustment and use of all mirrors so vital to the safe operation of the school bus?
 - a. In order to clear up blind spots around the bus.
 - b. In order to monitor the danger zone around the bus.
 - c. In order to observe the danger zone around the bus and look for students, traffic and other objects in this area.

4. Where does properly adjusted left and right side flat mirror enable visibility?
 - a. Along the sides of the bus and the rear tires touching the ground.
 - b. 200 feet or 2 bus lengths behind the bus.
 - c. Along the sides of the bus, 200 feet or 4 bus lengths behind the bus and the rear tires touching the ground.

5. What do the outside left and right cross view mirrors do?
 - a. They are used to see the danger zone area directly in front of the bus.
 - b. They present a view of people and objects that does not accurately reflect their size and distance from the bus.
 - c. Both of the above.

6. All mirrors should be viewed in what manner?
 - a. Simultaneously every 10 seconds.
 - b. In a logical sequence, checking traffic and passengers every 5 seconds.
 - c. In a logical sequence to ensure that a child or object is not in any of the danger zones.

7. Where are the blind spots on a bus?
 - a. In the rear of the bus extending up to 400 feet depending on the width of the bus.
 - b. Immediately below and in front of each mirror and directly in back of the rear bumper.
 - c. Both of the above.

SCHOOL BUS ENDORSEMENT

PART 2

LOADING AND UNLOADING

Loading and Unloading

Bus routes and stops are established cooperatively between the bus company and the school district. All stops should be approved by the school district prior to making the stop.

Approaching the Stop

Performing a safe stop:

- Approach cautiously
- Look around.
- Activate flashing ambers 300 feet before the stop.
- Turn on right turn signal 100-300 feet or 3-5 seconds before pulling over
- Continuously check mirrors
- Move to the right, staying on roadway.
- Bring the school bus to a full stop with the front bumper at least 10 feet away from students at the designated stop.
- Place transmission in Park.
- Open service door enough to activate flashing red lights.
- After all traffic has stopped, open doors and signal children to board.

Loading Procedures

- Perform a safe stop as described above.
- Students should wait in a designated location for the school bus, facing the bus as it approaches.
- Students should board the bus only when signaled by the driver.
- Monitor all mirrors continuously.
- Count the number of students at the bus stop and be sure all board the bus.
- Have the students board the school bus slowly, in single file, and use the handrail.
- Wait until students are seated and facing forward before moving the bus.
- Check all mirrors. Make certain no one is running to catch the bus.
- If you cannot account for a student outside, secure the bus, take the key, and check around and underneath the bus.

NOTES

Food for Thought:

You are loading students along the route. When should you activate your alternating flashing amber warning lights?

You are unloading students along your route. Where should students walk to after exiting the bus?

After unloading at school, why should you walk through the bus?

What position should students be in front of the bus before they cross the roadway?

Under what conditions must you evacuate the bus?

NOTES

Unloading Procedures on the Route

- Perform a safe stop at a designated unloading area.
- Have the students remain seated until told to exit.
- Check all mirrors.
- Count the number of students while unloading to confirm the location of all students before pulling away from the stop.
- Tell students to exit the bus and walk at least 10 feet away from the side of the bus to a position where the driver can plainly see all students.
- Check all mirrors again. Make sure no students are around or returning to the bus.
- If you cannot account for a student outside the bus, secure the bus, and check around and underneath the bus.

Special Dangers of Loading and Unloading

- Dropped or forgotten objects
- Handrail hang-ups

Handling Serious Problems

Tips on handling serious problems:

- Follow your school's procedures for discipline or refusal of rights to ride the bus.
- Stop the bus. Park in a safe location off the road.
- Secure the bus. Take the ignition key with you if you leave your seat.
- Stand up and speak respectfully to the offender or offenders. Speak in a courteous manner with a firm voice. Remind the offender of the expected behavior. Do not show anger but do show that you mean business.
- If a change of seating is needed, request that the student move to a seat near you.
- Never put a student off the bus except at school or at the designated school bus stop. If you feel the offense is serious enough that you cannot safely drive the bus, call for a school administrator or police to come and remove the student.

Emergency Exit and Evacuation

An emergency situation can happen to anyone, anytime, anywhere. Knowing what to do in an emergency—before, during and after an evacuation—can mean the difference between life and death.

The driver should evacuate the bus when:

- The bus is on fire or there is threat of a fire.
- The bus is stalled on or adjacent to a railroad-highway crossing.
- The position of the bus may change and increase the danger.
- There is an imminent danger of collision.
- There is a need to quickly evacuate because of a hazardous materials spill.

Evacuation Procedures

When possible, assign two responsible, older student assistants to each emergency exit. Teach them how to assist the other students off the bus. Assign another student assistant to lead the students to a "safe place" after evacuation. However, there may not be older, responsible students on the bus at the time of the emergency and emergency evacuation procedures must be explained to all students. This includes knowing how to operate the various emergency exits and the importance of listening to and following all instructions given by you.

Some tips to determine a safe place:

- A safe place will be at least 100 feet off the road in the direction of oncoming traffic. This will keep the students from being hit by debris if another vehicle hits the bus.
- Lead students upwind of the bus if fire is present.
- Lead students as far away from railroad tracks as possible and in the direction of any oncoming train.
- Lead students upwind of the bus at least 300 feet if there is a risk from spilled hazardous materials.
- If the bus is in the direct path of a sighted tornado and evacuation is ordered, escort students to a nearby ditch or culvert if shelter in a building is not readily available, and direct them to lie face down, hands covering their head. They should be far enough away so the bus cannot topple on them.

General Procedures

Determine if evacuation is in the best interest of safety.

Determine the best type of evacuation

- Front, rear or side door evacuation, or some combination of doors.
- Roof or window evacuation.

Secure the bus by:

- Placing transmission in Park, or if there is no shift point, in Neutral.
- Setting parking brakes.
- Shutting off the engine.
- Removing ignition key.
- Activating hazard-warning lights.

If time allows, notify dispatch office of evacuation location, conditions, and type of assistance needed.

- Dangle radio microphone or telephone out of driver's window for later use, if operable.
- If there is no radio, or the radio is inoperable, ask a passing motorist or area resident to call for help. As a last resort, dispatch two older, responsible students to go for help.

NOTES

Order the evacuation.

- Evacuate students from the bus.
- Do not move a student you believe may have suffered a neck or spinal injury unless his or her life is in immediate danger.
- Special procedures must be used to move neck spinal injury victims to prevent further injury.
- Direct a student assistant to lead students to the nearest safe place.
- Walk through the bus to ensure no students remain on the bus.
- Retrieve emergency equipment.
- Join waiting students. Account for all students and check for their safety.
- Protect the scene. Set out emergency warning devices as necessary and appropriate.
- Prepare information for emergency responders.

LOADING AND UNLOADING QUIZ

1. What is an example of a reason for mandatory evacuation of a school bus?
 - a. There is no radio communication with base
 - b. There are community adults on the scene
 - c. The bus is stalled on or adjacent to a railroad highway crossing.
 - d. All of the above

2. Why is understanding the loading or unloading procedure so critical?
 - a. Because only high school students understand how to cross the road.
 - b. Because more students are killed while getting on or off a school bus each year
 - c. Because motorists ignore students walking to school.
 - d. Because the school district is responsible for determining bus routes and bus stops.

3. Immediately after stopping you should
 - a. Open entrance door slightly to activate the stop arms and overhead red warning lights.
 - b. Tell the children to stand back until you are ready for them to load.
 - c. Get the children onto the bus as quickly as possible.

4. Pupils must walk at least how many feet in front of a school bus to cross the road?
 - a. 8 ft.
 - b. 10 ft.
 - c. 12 ft.
 - d. 15 ft

5. When approaching a school bus stop you should activate your overhead amber lights how far from the bus stop? (This may vary by state)
 - a. 50 ft
 - b. 100 ft.
 - c. 200 ft.
 - d. 300 ft.

NOTES

NOTES

Food for Thought:

How should you use your brakes if your bus is equipped with antilock brakes?

How far from the nearest rail should you stop at a highway-rail crossing?

What is a passive railroad-highway crossing?

Why should you be extra cautious at this type of crossing?

SCHOOL BUS ENDORSEMENT PART 3 RAILROAD CROSSINGS/ABS

Antilock Braking Systems

Your school bus will have a yellow ABS malfunction lamp on the instrument panel if it is equipped with ABS.

When you drive a vehicle with ABS, you should brake as you always have. In other words:

- Use only the braking force necessary to stop safely and stay in control.
- Brake the same way, regardless of whether you have ABS on the bus.

Note: The ABS Safety Reminders can be found in the ABS, Accidents and Fires section of this Study Guide. Consult the table of contents for the page number.

Railroad-highway Crossings

Recommended Procedures

Approaching the crossing:

- **Slow down**, including shifting to a lower gear in a manual transmission bus, and test your brakes.
- **Activate hazard lamps approximately 100 feet before the crossing.**
- Scan your surroundings and **check for traffic behind you.**
- **Stay to the right** of the roadway if possible.
- **Choose an escape route** in the event of a brake failure or problems behind you.

At the crossing:

- **Stop no closer than 15 feet and no farther than 50 feet from the nearest rail**, where you have the best view of the tracks.
- **Place the transmission in Park**, or if there is no Park shift point, in Neutral and press down on the service brake or set the parking brakes.
- Turn off all radios and noisy equipment, and **silence the passengers.**
- **Open the service door and driver's window.** Look and listen for an approaching train.

Crossing the tracks:

- **Check the crossing signals** again before proceeding.
- At a multiple-track crossing, stop only before the first set of tracks. When you are sure no train is approaching on any track, proceed across all of the tracks until you have completely cleared them.

- **Cross the tracks in a low gear. Do not change gears while crossing.**
- If the gate comes down after you have started across, drive through it even if it means you will break the gate.

Special Situations:

- Bus stalls or is trapped on tracks - **evacuate the bus**
- Police officer at the crossing- **obey directions**
- Obstructed view of tracks - **be careful**
- Containment or storage areas - **make sure you have enough room to fit on the other side of the tracks**

NOTES

NOTES

RAILROAD CROSSINGS/ABS QUIZ

1. School buses must stop at all railroad crossings no closer than:
 - a. 10 ft.
 - b. 15 ft.
 - c. 20 ft.
 - d. 25 ft

2. It is legal to shift gears in a school bus while crossing a railroad track?
 - a. True
 - b. False

3. What is a passive railroad crossing?
 - a. A railroad crossing that is no longer in use.
 - b. A railroad crossing that does not have any type of traffic control device.
 - c. A railroad crossing that has a traffic control device installed at the crossing to regulate traffic.

4. If the driver is evacuating the bus due to a stall or entrapment on railroad tracks what is the appropriate course of action?
 - a. Get everyone out of the bus and off the tracks immediately.
 - b. Move everyone from the bus at an angle away, which is both away from the tracks and toward the approaching train.
 - c. All of the above.

5. How should you brake in a vehicle with ABS brakes?
 - a. Pump the brakes in an emergency situation.
 - b. Apply the brakes as usual.
 - c. Apply the brakes but back off the brakes prior to the final stop.
 - d. Apply the brakes more firmly than usual.

6. What should you do if you have lost ABS control at one or more wheels?
 - a. Call dispatch to report the problem.
 - b. Drive normally because you still have regular brakes but have the system serviced soon.
 - c. Drive faster so your ABS yellow malfunction lamp will go out.
 - d. None of the above.

AIR BRAKES ENDORSEMENT

PART 1

If your location has buses with air brakes, you'll need to study the material in this section to pass your air brakes endorsement.

AIR BRAKE SYSTEM PARTS

The Parts of an Air Brake System

- **Air Compressor** - The air compressor is connected to the engine through gears or a v-belt and pumps air into the air storage tanks.
- **Air Storage Tanks** - Air storage tanks are used to hold compressed air. The tanks will hold enough air to allow the brakes to be used several times, even if the compressor stops working.
- **Air Compressor Governor** - The air compressor governor controls when the air compressor will pump air into the air storage tanks.
- **Air Tank Drains** - Each air tank is equipped with a drain valve in the bottom to get rid of daily water and oil buildup. They are either manual or automatically operated. Air tanks should be drained daily.
- **Alcohol Evaporator** - Some air brake systems have an alcohol evaporator that put alcohol into the air system. This helps to reduce the risk of ice in the air brake valves which can cause the brakes to stop working. Check the alcohol container and fill up as necessary, every day during cold weather.
- **Safety Valve** - A safety relief valve is installed in the first tank to protect the tank and the rest of the system from too much pressure. The valve is usually set to open at 150 psi.
- **The Brake Pedal** - You apply the brakes by pushing down on the brake pedal. It is also called the foot valve or treadle valve.
- **Foundation Brakes** - S-cam Brakes: When you push the brake pedal, air is let into each brake chamber. Air pressure pushes the rod out, moving the slack adjuster, thus twisting the brake camshaft. This turns the S-cam (so called because it is shaped like the letter "S"). The S-cam forces the brake shoes away from one another and presses them against the inside of the brake drum. When you release the brake pedal, the S-cam rotates back and a spring pulls the brake shoes away from the drum, letting the wheels roll freely again.

Two other types of air brakes are wedge brakes and disc brakes. These are less common than s-cam brakes.

NOTES

Food for Thought:

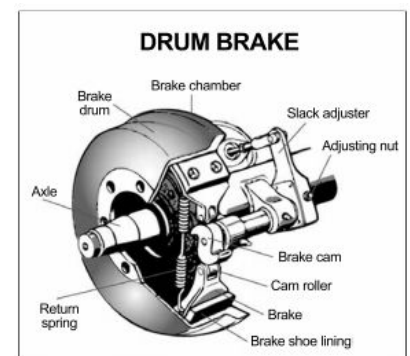
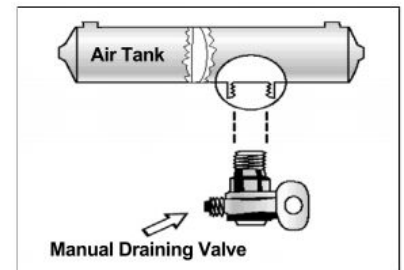
Why do air brakes take longer to stop than hydraulic brakes?

Why must air tanks be drained?

How often should you drain them?

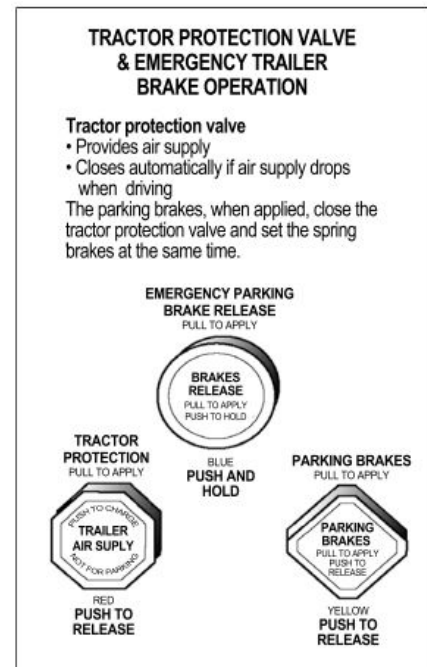
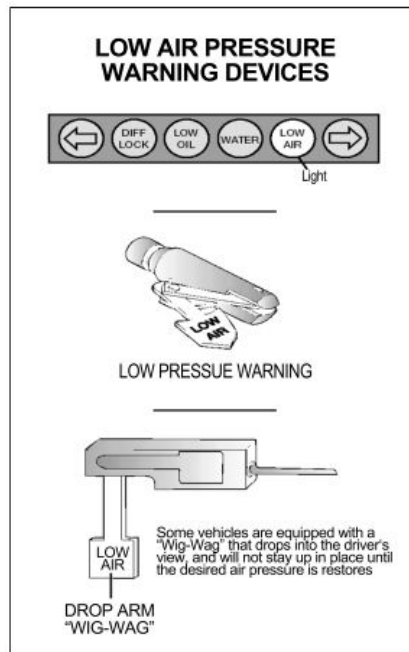
What is a supply pressure gauge used for?

What are spring brakes?



NOTES

- **Low Air Pressure Warning** - A low air pressure warning signal lets you see when air pressure in the tanks falls below 60 PSI. The warning is usually a red light. A buzzer may also come on. Another type of warning is the "wig wag." This device drops a mechanical arm into your view when the pressure in the system drops below 60 PSI.
- **Stop Light Switch** - The air brake system turns on the brake lights with an electric switch that works by air pressure when you put on the air brakes.
- **Spring Brakes** - Spring brakes are a secondary way of applying the brakes, for use as emergency brakes and parking brakes. Rather than using air pressure, spring brakes are activated and held on by mechanical force. They employ powerful springs in the brake drum that are held back by air pressure. If the air pressure drops too low, such as with a leak in the air system, the springs will automatically put on the brakes.
- **Parking Brake Controls** - You put on the parking brakes using a diamond shaped, yellow pushpull control knob. Pull the knob out to put the parking brakes on, push it in to release them. Use the parking brakes whenever you park. If the yellow knob pops out that indicates the spring brakes have engaged.
- **Antilock Braking Systems (ABS)** - Vehicles with ABS have yellow malfunction lamps to tell you if something isn't working. Tractors, trucks, and buses will have yellow ABS malfunction lamps on the instrument panel.



AIR BRAKE SYSTEM PARTS QUIZ

1. Which brake system applies and releases the brake when the driver uses the brake pedal?
 - a. The emergency brake system.
 - b. The service brake system.
 - c. The parking brake system.
 - d. None of the above.

2. Oil and water that collect in air tanks can make brakes fail. If you do not have automatic drains, when should you drain the air tanks?
 - a. Every four hours
 - b. Every day
 - c. Every week
 - d. Every other week

3. The air supply pressure gauge shows the driver how much pressure:
 - a. Has been used in the trip.
 - b. Is available in the air tanks.
 - c. Is being sent to the brake chambers.
 - d. None of the above.

4. When using the parking brakes or emergency brakes, what type of pressure is being used?
 - a. Fluid pressure.
 - b. Spring pressure.
 - c. Air pressure.
 - d. Any of the above.

5. In air brake equipped vehicles, you use the parking brakes:
 - a. When slowing down.
 - b. As little as possible.
 - c. Whenever you park the vehicle.
 - d. Only during pre-and post-trip inspections.

6. The air compressor governor controls:
 - a. The RPMs of the air compressor.
 - b. Whether the compressor is on or off.
 - c. Air pressure applied to the brakes.
 - d. When the compressor pumps air into the storage tanks.

7. The brake pedal:
 - a. Is the main lever in the system.
 - b. Can be a foot rest during normal driving.
 - c. Controls the air pressure applied to operate the brakes.
 - d. Exerts force on the slack adjuster by rods and connectors.

8. The application pressure gauge shows the driver how much pressure:
 - a. Has been used on the trip.
 - b. Is available in the air tanks.
 - c. Is being sent to the brake chambers.
 - d. None of the above.

NOTES

NOTES

Food for Thought:

What is a dual air brake system?

How can you check that the spring brakes come on automatically?

What are slack adjusters and how do you check them?

How can you test the low pressure warning signal?

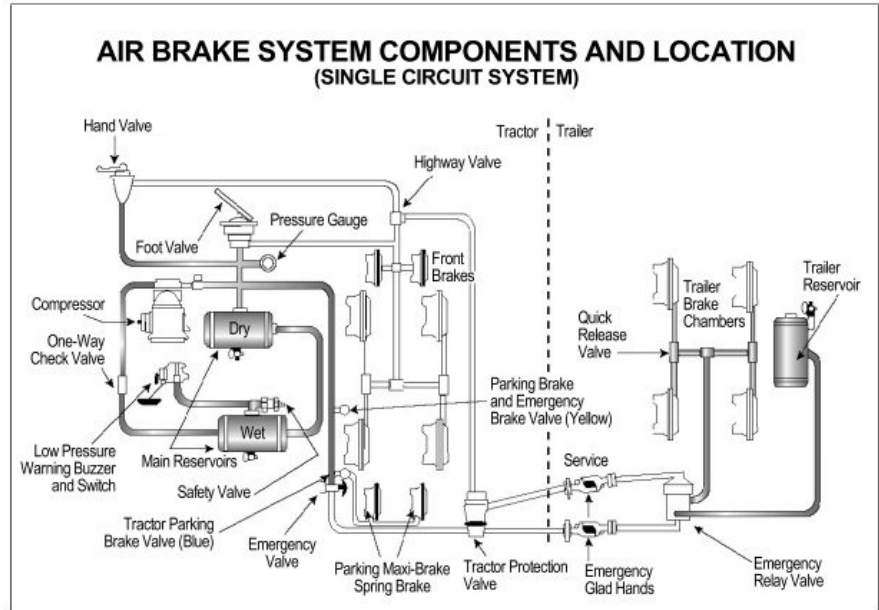
What are the maximum allowable air leakage rates?

AIR BRAKES ENDORSEMENT

PART 2

Dual Air Brake Systems

Some buses and many trucks use dual air brake system systems for safety. A dual air brake system has **two separate air brake systems, which use a single set of brake controls.**



INSPECTING AIR BRAKE SYSTEMS

During Step 2 Engine Compartment Checks:

Check Air Compressor Drive Belt

During Step 5 Walk-Around Inspection:

- **Check Slack Adjusters on the S-cam brakes** - Turn off the parking brakes so you can move the slack adjusters. Use gloves and pull hard on each slack adjuster that you can reach. If a slack adjuster moves more than about one inch where the push rod attaches, it probably needs adjustment.
- **Check Brake Drums (or Discs), Linings, and Hoses** - Brake drums must not have cracks longer than one half the width of the friction area.

Step 7 Final Air Brake Check:

- **Test Low Pressure Warning Signal** - Shut the engine off when you have enough air pressure so that the low pressure warning signal is not on. Turn the electrical power on and step on and off the brake pedal to reduce air tank pressure. The low air pressure warning signal must come on before the pressure drops to less than 60 psi in the air tank.
- **Check Spring Brakes Come On Automatically** - Continue to bleed

off air pressure by stepping on and off the brake pedal to reduce tank pressure. The tractor protection valve and parking brake valve should close or pop out on a tractor-trailer combination vehicle and the parking brake valve should close or pop out on other combination and single vehicle types when the air pressure falls to about 20-40 psi. This will cause the spring brakes to come on.

- **Check Rate of Air Pressure Buildup**
Dual air systems: When the engine is at operating RPMs, the pressure should build from 85-100 psi within 45 seconds.
Single air systems: Typical requirements are pressure buildup from **50 to 90 psi within 3 minutes** with the engine at an idle speed of 600-900 RPMs
- **Test Air Leakage Rate** - With a fully-charged air system (typically 125 psi), turn off the engine, release the parking brake, and time the air pressure drop.
The loss rate should be **less than 2 psi in one minute for single vehicles** and less than 3 psi in one minute for combination vehicles. Then apply 90 psi or more with the brake pedal. After the initial pressure drop, **if the air pressure falls more than three psi in one minute for single vehicles** (more than four psi for combination vehicles), the air loss rate is too much.
- **Check Air Compressor Governor Cut-in and Cut-out Pressures** - The air compressor should start pumping when pressure in the tank falls to about 100 psi and keep pumping until it reaches about 125 psi. To check the governor, run the engine at a fast idle. The air governor should cut-out the air compressor at about the specified pressure. The air pressure shown by your gauge will stop rising. With the engine idling, step on and off the brake to reduce the air tank pressure. The compressor should cut-in at about the manufacturer's specified cut-in pressure. The air pressure should begin to rise.
- **Test Parking Brake** - Stop the vehicle, put the parking brake on, and gently pull against it in a low gear to test that the parking brake will hold.
- **Test Service Brakes** - Wait for normal air pressure, release the parking brake, move the vehicle forward slowly (about five mph), and apply the brakes firmly using the brake pedal. Note any vehicle "pulling" to one side, unusual feel, or delayed stopping action.

NOTES

INSPECTING AIR BRAKES QUIZ

1. A combination vehicle air brake system cannot leak more than ___ psi per minute with the engine off and the brakes released.
 - a. 1
 - b. 2
 - c. 3
 - d. 4

2. Air loss in a single vehicle should not be more than _____ with the engine off and the brakes on.
 - a. 1 psi in 30 seconds
 - b. 1 psi in one minute
 - c. 2 psi in 45 seconds
 - d. 3 psi in one minute

3. You have a dual air brake system on a straight truck or bus. If a low air pressure warning comes on for only one system, what should you do?
 - a. Reduce your speed and drive to the nearest service garage.
 - b. Reduce your speed and test the remaining system.
 - c. Try to find a repair station before the emergency brakes lock.
 - d. Stop and safely park - do not continue until the system has been repaired.

4. Of the choices below, the first thing to do when a low air pressure warning comes on is:
 - a. Stop and safely park as soon as possible.
 - b. Upshift.
 - c. Adjust the brake pedal for more travel.
 - d. Open the air supply control valve.

5. How do you check the free play in the manual slack adjusters?
 - a. Stop on level ground and apply the emergency brakes.
 - b. Park on level ground, chock the wheels, release the parking brakes and pull on the slack adjusters.
 - c. Park on level ground and drain off air pressure before making adjustments.
 - d. Apply the service brakes by hand at the brake chambers and watch the slack adjusters move.

6. If your truck or bus has dual parking control valves, you can use pressure from a separate tank to:
 - a. Release the emergency brakes to move a short distance.
 - b. Apply more brake pressure for stopping if you think the main tank is getting low.
 - c. Stay parked without using up service air pressure.
 - d. Balance the service brake system while you drive.

AIR BRAKES ENDORSEMENT

PART 3

USING AIR BRAKES

Normal Stops

When using air brakes for normal stops, just push the brake pedal down. Control the pressure so the vehicle comes to a smooth, safe stop.

Braking with Antilock Brakes - Most of the time, braking with antilock brakes is no different than normal.

Emergency Stops **Controlled Braking**

With the controlled braking method - sometimes called "squeeze braking" - you apply the brakes as hard as you can without locking the wheels. Keep steering wheel movements very small while doing this. If you need to make a larger steering adjustment or if the wheels lock, release the brakes. Re-apply the brakes as soon as you can.

Stab Braking

Stab Braking is:

Applying your brakes all the way.

Then release the brakes when wheels lock up.

As soon as the wheels start rolling, apply the brakes fully again.

Stopping Distance

With air brakes there is an added delay - **the time required for the brakes to work after the brake pedal is pushed**. With hydraulic brakes, the brakes work instantly. However, with air brakes, it takes a little time (one half second or more) for the air to flow through the lines to the brakes. Thus, the total stopping distance for vehicles with air brake systems is made up of four different factors:

Perception Distance+ Reaction Distance+ Brake Lag Distance+ Effective Braking Distance = Total Stopping Distance

Stopping Distance at 55 MPH With Air Brakes

	Perception Distance	60 ft
+	Reaction Distance	60 ft
+	Brake Lag Distance	32 ft
+	Braking Distance	170 ft
=	Total Stopping Distance	322 ft

NOTES

Food for Thought:

You still have normal brake functions if your ABS is not working. True or False?

Why should you be in the proper gear before starting down a hill?

What factors can cause brakes to fade or fail?

The use of brakes on a long, steep downgrade is only a supplement to the braking effect of the engine. True or False?

If you are away from your vehicle only a short time, you do not need to use the parking brake. True or False?

NOTES

Proper Braking Technique

The use of brakes on a long and/ or steep downgrade is only a supplement to the braking effect of the engine. Once the vehicle is in the proper low gear, the following is the proper braking technique:

1. Apply the brakes just hard enough to feel a definite slowdown.
2. When your speed has been reduced to approximately five mph below your "safe" speed, release the brakes.
3. When your speed has increased to your "safe" speed, repeat steps 1 and 2.

Low Air Pressure

If the low air pressure warning comes on, stop and safely park your vehicle as soon as possible. There might be an air leak in the system.

Parking Brakes

Any time you park, **use the parking brakes**, except in a few special circumstances.

Pull the parking brake control knob out to apply the parking brakes, and push it in to release. The control will be a yellow, diamond shaped knob labeled "parking brakes" on newer vehicles.

Don't use the parking brakes if the brakes are very hot or if the brakes are very wet in freezing temperatures.

If you can't use the parking brake when you park, use wheel chocks to hold the vehicle.

Never leave your vehicle unattended without applying the parking brakes or chocking the wheels. Your vehicle might roll away and cause injury and damage.

USING AIR BRAKES QUIZ

1. School buses must stop at all railroad crossings no closer than:
 - a. 10 ft.
 - b. 15 ft.
 - c. 20 ft.
 - d. 25 ft

2. Air brakes take longer to stop than hydraulic brakes because:
 - a. The reaction time is longer for the driver
 - b. It takes longer for air to flow through the lines
 - c. The linings get hotter more quickly
 - d. Air brakes always have small air leaks.

3. Should you ever leave your vehicle unattended without applying the parking brakes or chocking the wheels?
 - a. Yes
 - b. No

4. If you are away from your vehicle only a short time, you don't need to use the parking brake:
 - a. True
 - b. False

5. The use of brakes on a long steep downgrade is only a supplement to the braking effect of the engine:
 - a. True
 - b. False

6. What factors can cause brakes to fade or fail?
 - a. Over heating, low air pressure and not relying on the engine braking effect
 - b. Not pressing the brake pedal hard and long enough
 - c. Not taking your foot off the accelerator pedal
 - d. All of the above

7. Why should you be in the proper gear before starting down a hill?
 - a. So you only have to apply the brake just hard enough to feel a definite slowdown
 - b. So you don't have to shift gears going downhill
 - c. So you can go through the gears on the way down
 - d. All of the above

8. Which of the following makes the total stopping distance longer for air brakes than hydraulic brakes?
 - a. Perception distance
 - b. Reaction distance
 - c. Brake lag distance
 - d. Effective braking distance

9. Why should you drain air tanks?
 - a. To drain all the air out of the tank
 - b. To drain moisture and oil out of the tank
 - c. To keep anyone from moving the vehicle

NOTES

TEST TIPS

This is a compilation of Test Tips mentioned in the First Student CDL Training Program.

1. With multiple choice questions, read the question and each answer all the way through before you choose a response. That way you won't be tempted to choose the first answer that "looks right."
2. When the answers all look pretty similar, like in the practice question below, try doing a word-by-word comparison. Eliminate the obvious wrong answers. That can help you determine the right answer from what's left.

What sort of things should you inspect during a trip?

a) Gauges, exhaust, lights, cargo and coupling devices

b) Gauges, brakes, lights, pumps and hoses

c) Gauges, brakes, lights, cargo and coupling devices

d) Gauges, tires, shock absorbers, brake shoes and frame members

3. One common type of question you'll face on the CDL is "which of these statements is true." This type of question is then followed by several multiple choice answers. (See the example below.)
 - The best way to answer these questions correctly is to read each answer carefully to see if it has a word or phrase that is NOT true.
 - Once you've found something that makes that choice untrue, move on to the next.
 - After you've eliminated all the untrue statements, the only one left must be true.
 - By the way, if one answer is "All of the above are true" - finding one untrue answer in the group makes that answer untrue as well! If you find more than one correct statement, the correct answer is probably "All of the above."

Which of these statements about test taking is true?

a) You should stay awake the night before a big test.

b) When you take a test, just write down the first answer that comes to mind.

c) It is better to study some every day before a test than to try to cram it all in the day before.

d) All of the above are true

4. In many states, CDL testing is administered on computers. You see one question at a time on the screen and can answer it or skip it. As soon as you achieve the required number of correct answers, you

pass the test.

- If you don't know an answer the best test strategy is to skip the question and go on to the next one. DON'T GUESS.
 - When you've reached the end of the test, the questions you've skipped will come around again.
 - At this point, you may be able to answer the question because a question elsewhere on the test gave you a clue about the answer to one you are struggling with.
 - If you still don't know the answer the second time you see the question, then guess at it, however, your odds of guessing right on true/ false questions are better than on multiple choice.
5. Here are some Rules of Thumb for True/False questions:
 - Read through each statement carefully, and pay attention to the qualifiers and keywords.
 - On most tests, there are usually more true answers than false ones.
 - If any part of the question is false, then the entire statement is false, but just because part of a statement is true doesn't necessarily make the entire statement true.
 6. Here are some more Rules of Thumb for True/False questions:
 - Words like "never, always, and every" mean that the statement must be true all of the time. Usually these type of qualifiers lead to an answer that's false.
 - Words like "usually, sometimes, and generally" mean that if the statement can be considered true or false depending on the circumstances. Usually these type of qualifiers lead to an answer that's true.
 7. Here are some general tips for when you're unsure of the correct answer.
 - In a question with "All of the Above" as a choice, if you see at least two correct statements then "All of the Above" is probably the correct answer.
 - Usually the correct answer is the choice with the most information.
 - If two answer options are opposites of each other, chances are one of them is the correct answer.
 8. It's possible you'll get a question on the test that contains material that was not covered in this training program or that you did not study for. You can probably figure out the answer to the question just by thinking about it logically and applying common sense.
 9. With questions that ask for number response, you often need to simply "know the answer" since logic may not play a role.
 10. How do you pass the CDL test? Practice! Practice! Practice! This booklet contains a series of practice questions, both for the general knowledge test and the endorsement tests. After you've taken each practice test, you can check your answers against the answer sheet found at the end of the test. If you do well, great! If not, review your

NOTES

Study Guide till you do.

11. Some questions may have answer options that include the words “only” and “every.” An earlier test tip advised that answers with “always” and “never” were usually false or incorrect. With “only” and “every” it’s not quite that simple.
 - When only is used in a question, consider whether those are the ONLY times you should complete an action.
 - When every is used in a question, consider whether the action should be completed EVERY time.
 - Watching how ONLY and EVERY are used can increase your chances of getting the answer right.
12. If the test is given via touch screen computer and you’ve never used one, don’t let the technology intimidate you. Just follow the directions and concentrate on showing what you’ve learned.
13. Keep a positive attitude throughout the whole test and try to stay relaxed, if you start to feel nervous take a few deep breaths to relax.
14. Remember these study tips:
 - Review this Study Guide
 - Study your state’s CDL manual
 - Take the practice tests
 - Look up any answers you missed
 - Don’t stress out about it

If you invest the time into preparation, you should do just fine.

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