

# Entry-Level Driver Training (ELDT) Theory Curriculum

Prepared for Minnesota Transit Agencies by Minnesota RTAP



**CLASS B to A WITH PASSENGER  
ENDORSEMENT**

Last Updated August 30, 2024

# Symbols Guide



Class B



Passenger Endorsement



Class A



Class B to A

Not Relevant for Transit, Still Must Learn

Not relevant to public transit, but you must still train on this for ELDT

# Introduction

This training was developed by the Minnesota Rural Transit Assistance Program (RTAP) in collaboration with transit professionals and trainers throughout the state.

**Some of the content may not apply to your role as a public transit operator; however, all of it must be covered to meet the ELDT requirement for your CDL.**

Please consult your instructor with any questions about what content applies to your role as a transit operator.

# Section 1: Basic Operation



# Unit 1.1 Orientation

*This unit satisfies FMCSA's ELDT requirements for units A1.1.1, BA1.1.1, and B1.1.1, and C1.3.*

# Orientation

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- This training is for new drivers pursuing a CDL.
- Many subjects will be reviewed to ensure that you understand safety fundamentals and essential regulatory requirements for driving.
- In this curriculum, you will also be taught your responsibilities not directly related to CMV driving, such as proper cargo securement.

# Orientation

- The training will also cover the ramifications, including driver disqualification provisions and fines for non-compliance along with an overview of the applicability of state and local laws relating to the safe operation of the CMV, stopping at weigh stations/scales, hazard awareness of vehicle size and weight limitations, low clearance areas. and bridge formulas.
- Consequences for non-compliance may include loss of CDL driving privileges and fines for you and the carrier/employer.

# Orientation

- Knowing the weight of your vehicle is important to safety. Roads and other road structures (such as parking lots) are built to handle maximum weights. There is a significant weight difference between large trucks and buses and other vehicles on the road, which means there are greater consequences with there is an accident.
- GVW - Gross vehicle weight. The greater of the unloaded weight of a vehicle plus the weight of the load; or the value specified by the manufacturer as the maximum gross weight or gross vehicle weight rating (GVWR).
- GVWR - Gross vehicle weight rating. Means the value specified by the vehicle manufacturer as the loaded weight of a single motor vehicle.
- Axle Weight = The weight transmitted to the ground by one axle or one set of axles.

Sources: [\*Minnesota Commercial Driver's License Manual\*](#) and [\*Minnesota Commercial Truck and Passenger Regulations, 2021\*](#)



# Orientation

- The size and design of your vehicle impacts how it maneuvers and where you can travel.
- Height is measured from level road surface to top of load or vehicle. CMVs can be too tall for some of the clearances of bridges and other fixed objects such as canopies at hotels, clinics, etc. Tall vehicles also have a higher center of gravity and have a higher risk of roll overs than smaller vehicles.
- Ground Clearance (also known as ride height) is the minimum distance between the lower end of the vehicle body and the road. When you load a vehicle with passengers or cargo, the available height is lowered. Low ground clearance is difficult on rough roads. The underbelly of the vehicle can get scratched, or it can get hung up on the tracks at a railroad crossing. Vehicles with higher ground clearance are more likely to turn over.

Sources: [Minnesota Commercial Driver's License Manual](#) ; [Minnesota Commercial Truck and Passenger Regulations, 2021](#) and [www.fmcsa.dot.gov/ourroads/limited-maneuverability](http://www.fmcsa.dot.gov/ourroads/limited-maneuverability)

# Orientation

- The vehicle's width, length, rear overhang impact its tail swing. The rear overhang impacts tail swing the most. Tail swing occurs when the movement of the rear portion of the vehicle swings in the opposite direction of the front end, while the front end turns. You must account for these factors to avoid hitting objects with the rear of your vehicle.
- Rear Overhang is the distance between the center of the rear axle to the bumper/bed of the vehicle. The greater the distance, the larger the swing when turning.
- Length is a bumper-to-bumper measurement. Maximum length in Minnesota for a single motor vehicle without requiring a special permit is 45 feet.
- Width is measuring from the widest points on each side of the vehicle or load, exclusive of side rear view mirrors or load securement devices, which may extend an additional 3 inches on each side of vehicle. Maximum width allowed without requiring a special permit is 8 feet, 6 inches.

Sources: [Minnesota Commercial Driver's License Manual](#) ; [Minnesota Commercial Truck and Passenger Regulations, 2021](#) and [www.fmcsa.dot.gov/ourroads/limited-maneuverability](http://www.fmcsa.dot.gov/ourroads/limited-maneuverability)

# Orientation

## Wheels, rims and tires

- The wheel is the metal part the tire is fit into. The rim is the other edge of the wheel. Tires are the rubber portion of the wheel that grips the road.
- Tire rating: Tires are rated on treadwear, traction performance, temperature resistance and tire load. These ratings are marked on the sidewall of the tire.
- Tire Load is the maximum safe weight a tire can carry at a specified pressure. This rating is stated on the side of each tire.
- The steering wheels (the wheels that determine the direction your vehicle moves) are the front axle tires and wheels.

Sources: [Minnesota Commercial Driver's License Manual](#) and [www.nhtsa.gov/equipment/tires](http://www.nhtsa.gov/equipment/tires)

# Orientation

- You will notice that the steering wheel on a CMV is a lot larger than a car's steering wheel. It is lower, and oriented in the horizontal plane. It is just as easy to turn as a car's wheel, but it takes many turns to go from a full right turn to a full left turn.
- Mirrors: You have a side mirror on each side of the vehicle.
- Headlights, parking lights, & turn signals are seen just above the bumper. Clearance lights are present across the very top of the motor coach.
- Note the large windshields, which may be one or multiple pieces of glass.

Source: [\*FMCSA Model Training Curriculum for Motorcoach Drivers\*](#)

# Orientation

- Brakes systems can be hydraulic or air. All CMVs have service brakes, parking brakes and emergency breaks. Most large CMVs are equipped with air brakes.
- Engine Compartment: Often located in the front of smaller buses and in the back on large buses.
- Electrical system basic components are the starter motor, battery and alternator.

Sources: [FMCSA Model Training Curriculum for Motorcoach Drivers](#) and [fleetnetamerica.com/blog/post/electrical-systems-in-heavy-duty-vehicles](https://fleetnetamerica.com/blog/post/electrical-systems-in-heavy-duty-vehicles)

# Orientation

## Proper Cargo Securement

- Blocking is used in the front, back, and/or sides of a piece of cargo to keep it from sliding. Blocking is shaped to fit snugly against cargo and secured to the cargo deck to prevent cargo movement.
- Bracing goes from the upper part of the cargo to the floor and/or walls of the cargo compartment.
- Cargo Tie-down
  - On flatbed trailers or trailers without sides, cargo must be secured to keep it from shifting or falling off. In closed vans, tie-downs can also be important to prevent cargo shifting that may affect the handling of the vehicle. Tie-downs must be of the proper type and proper strength.
  - The aggregate working load limit of any securement system used to secure an article or group of articles against movement must be at least one-half times the weight of the article or group of articles. Proper tie-down equipment must be used, including ropes, straps, chains, and tensioning devices (winches, ratchets, clinching components). Tie-downs must be attached to the vehicle correctly (hooks, bolts, rails, rings).

Source: [\*Minnesota Commercial Driver's License Manual\*](#)

# Orientation

## Proper Cargo Securement, continued

- Header Boards
  - Front-end header boards (“headache racks”) protect you from your cargo in case of a crash or emergency stop. Make sure the front-end structure is in good condition. The front-end structure should block the forward movement of any cargo you carry.

Source: [\*Minnesota Commercial Driver's License Manual\*](#)

# Orientation

## What is a commercial motor vehicle?

A vehicle having

- a gross vehicle weight rating (GVWR) of 10,001 pounds or more;
- designed to transport >15 passengers, including the driver;
- or transporting hazardous materials in quantities requiring the vehicle to be placarded.

**Reference:** Section 204 of the Motor Carrier Safety Act of 1984 (MCSA) (Pub. L. 98-554, Title II, 98 Stat. 2832, at 2833)



# Orientation

## What is a combination vehicle?

A combination vehicle is formed when a truck tractor or straight truck has a trailer added to it.

# Orientation

**What are the 3 commercial motor vehicle groups according to FMCSA?**

CMV Group	Definition
<b>GROUP A</b> (Combination Vehicle)	Any combination of vehicles with a gross combination weight rating (GCWR) of 26,001 pounds or more, provided the gross vehicle weight rating (GVWR) of the vehicle(s) being towed is in excess of 10,000 pounds.
<b>GROUP B</b> (Heavy Straight Vehicle)	Any single vehicle with a GVWR of 26,001 pounds or more, or any such vehicle towing a vehicle not in excess of 10,000 pounds GVWR.
<b>GROUP C</b> (Small Vehicle)	Any single vehicle, or combination of vehicles, that does not meet the definition of Group A or Group B, but is designed to transport 16 or more passengers including the driver, or is used in the transportation of hazardous materials as defined in <a href="#">49 CFR 383.5</a> .

# Orientation

## What vehicles require a CDL in Minnesota?

- A combination of vehicles in which
  - the gross combination weight (GCW) >26,000 pounds
  - the towed unit has a gross vehicle weight (GVW)\* >10,000 pounds
- A single vehicle with a GVW >26,000 pounds
- A vehicle designed to transport >15 passengers, including the driver
- Any size vehicle that requires hazardous materials placards
- Any size vehicle outwardly equipped and identified as a school bus

# Orientation

## **What are Federal Motor Carrier Safety Regulations (FMCSRs) and Hazardous Materials Regulations (HMRs) and Where are They Published?**

- What: Set minimum safety standards for motor carriers and drivers.
- Where: [Title 49 of the U.S. Code of Federal Regulations \(CFR\)](#)
- Organized into Sections and Parts, designated by a numbered entry. Citations appear as follows: 49 CFR 390 or 49 CFR 390.15, where:
  - Title: 49
  - Part: 390
  - Section: 15
  - Title 49 governs transportation

# Orientation

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## What are the characteristics of passenger-carrying CMVs?

Per the FMCSA, “a bus is a motor vehicle designed, constructed and/or used to transport passengers. A motorcoach is a bus designed with an elevated passenger deck located over a baggage compartment. A minibus is designed to transport 16 or more passengers (including the driver) and is typically built on a small truck chassis.”

# Orientation

## Safety fundamentals

- Understanding potential hazards
- Scanning the roadway for present or developing hazards
- Allowing yourself time to react to hazards
- Understanding your options in reacting to hazards present

When you consistently apply these fundamental concepts, your risk of being involved in preventable collisions will decrease.

Source: [FMCSA Model Training Curriculum for Motorcoach Drivers](#)

# Orientation

## Seat Adjustment

- The seat is adjusted in two major ways: up and down (height) and forward and back.
- Both adjustments should permit you to reach and operate the accelerator, brake, and any other foot controls easily; the seat position should allow you to depress the brake pedal all the way to the floor.
- The height adjustment should eliminate pressure to the bottom of your thigh when your foot is on the accelerator. A seat that is too high can affect circulation to your legs and feet.
- The forward and back adjustment should let you easily touch the top of the steering wheel. When this is set properly, your elbows will be slightly bent when your hands are at the 8 and 4 o'clock positions on the steering wheel.



Source: [\*FMCSA Model Training Curriculum for Motorcoach Drivers\*](#)

# Orientation

## Mirror Adjustment – Flat Mirrors

- If necessary, move the arm holding each mirror so that you have an unobstructed view of the entire mirror.
- Rotate both flat mirrors horizontally until the inside edges pick up the rear corners of the coach body. This is just to permit you to see what is happening right next to the coach. Rotating them inward any further is a common mistake and will limit their benefit — you don't need to see the side of the coach — you need to see what is along the outside of the coach.
- Rotate the left (driver side) flat mirror vertically until the bottom one-third of the mirror shows the roadway. That is, the horizon is about one-third of the way from the bottom of the mirror.
- Rotate the right flat mirror vertically until the bottom two-thirds of the mirror shows the roadway. The horizon should be about one-third of the way from the top of the mirror. You should be able to see the right rear wheel(s) of the coach.

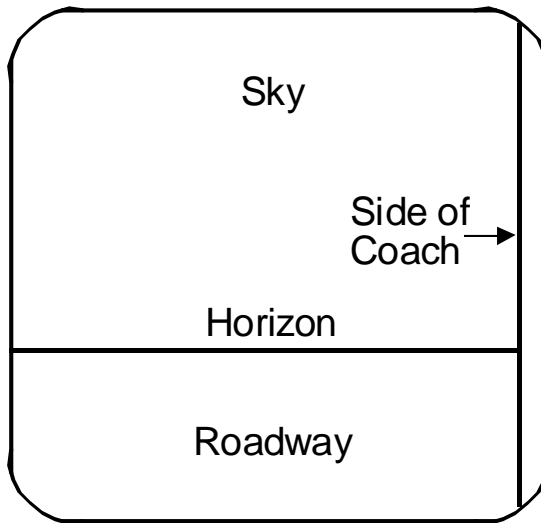
Source: [\*FMCSA Model Training Curriculum for Motorcoach Drivers\*](#)



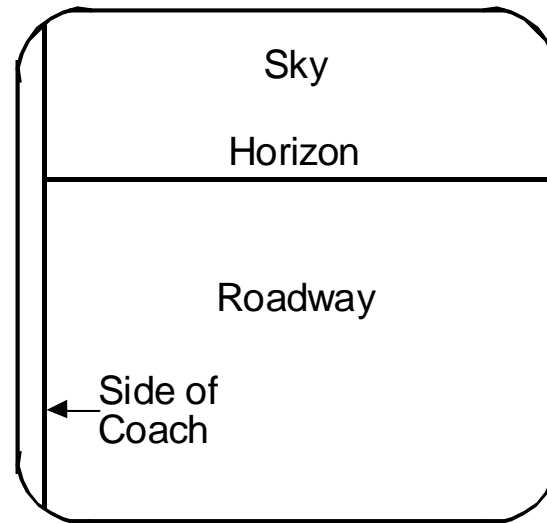
# Orientation

## Mirror Adjustment

Left Side Mirror



Right Side Mirror



Source: [\*FMCSA Model Training Curriculum for Motorcoach Drivers\*](#)

# Orientation

## Mirror Adjustment – Convex Mirrors

Because of their curvature, convex mirrors can show you areas that the flat mirrors do not. They help you see further out to the left and right and they allow you to see the roadway closer to the front of the coach, minimizing, but not eliminating, the left and right blind spots. They are very common, though not all buses may have them, so be sure you always set your flat mirrors properly even if you have convex mirrors on most coaches you operate.



Source: [\*FMCSA Model Training Curriculum for Motorcoach Drivers\*](#)

# Orientation

## Mirror Adjustment – Convex Mirrors

- Some convex mirrors are mounted on flat mirrors and are not adjustable. If your convex mirrors can be adjusted independently of your flat mirrors, follow this procedure to set them:
  - Rotate each convex mirror horizontally until the inside edge of its field of view overlaps with the outside edge of the flat mirror's field of view. Drivers with separately adjustable convex mirrors frequently set them in such a way that the views in the convex mirrors overlap a lot with the views in the flat mirrors. There should always be some overlap, but there should not be much.
  - Tilt the left (driver's side) convex mirror vertically until a point 40 feet from the mirror can be seen in the top edge of the mirror. (The end of the coach is about 40 feet away.)
  - Tilt the right convex mirror vertically until the bottom edge of its field shows the roadway just behind the door.

# Orientation

## Mirror Adjustment – Convex Mirrors

The convex mirrors should supplement the information provided by the flat mirrors.

When set this way, they will let you see areas that the flat mirrors cannot show you. If you can see a vehicle in your convex mirror but not in your flat mirror, you can be sure it is beside the vehicle, not in back of the vehicle.

# Orientation

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## **Spare Tire Storage**

If your bus is equipped with a spare tire, please review the location of the spare tire(s) with your supervisor and how to access it.

# Orientation

## Bridge Formulas

- You must keep weights within legal limits. States have maximums for GVWRs, GCWRs, and axle weights.
- Often, maximum axle weights are set by a bridge formula. A bridge formula permits less maximum axle weight for axles that are closer together. This is to prevent overloading bridges and roadways.
- Overloading can have negative effects on steering, braking, and speed control.
- Overloaded trucks have to go very slowly on upgrades and gain too much speed on downgrades. Stopping distance increases. Brakes can fail when forced to work too hard. During bad weather or in mountains, it may not be safe to operate at legal maximum weights. Take this into account before driving.
- You can find information on Minnesota's bridge formulas [on this website](#)

# Orientation

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## Height Limitations and Clearances

- No vehicles in Minnesota may exceed a height of 13 feet, 6 inches without a special permit
- When overpasses are lower than 14-feet, 6-inches (a foot above regulation height) MnDOT posts either a bridge height to notify drivers or a low clearance' sign.
- You also may be able to search for low clearance bridges and overpasses in your state/region, so you are prepared when trip planning.

# Orientation

## Hazard Awareness of Vehicle Size and Weight Limitations

- Size differences greatly affect how truck and bus drivers operate – and all road users should be aware of their unique safety challenges to help keep everyone on our roads safe.
- Trucks are often 20 to 30 times heavier than passenger vehicles.
- The huge mass of a truck or bus increases the risk of more severe crash damage, injuries and fatalities.





# Orientation

## Hazard Awareness of Vehicle Size and Weight Limitations

- Tall vehicles have a higher center of gravity, roll over more easily than smaller vehicles and must go much slower on curves and ramps.
- Large vehicles generate wind gusts that can push smaller vehicles into other lanes.
- Smaller vehicles can be pushed or pulled under a commercial vehicle with high ground clearance.
- Drivers must obey all posted signs regarding maximum truck width, length, height and weight limits.



# Unit 1.2 Control Systems/Dashboard

*This unit satisfies FMCSA's ELDT requirements for units A1.1.2, BA.1.1.2, and B1.1.2*

# Control Systems/Dashboard

## **Dashboard Gauges:**

- Oil Pressure
- Ammeter and/or Voltmeter
- Coolant Temperature
- Engine Oil Temperature
- Warning Lights & Buzzers (Oil, coolant, charging circuit warning lights should go out right away)

## **Lights:**

- Headlights
- Dimmer Switch
- Turn Signal
- Four-Way Flashers
- Clearance, Identification, Marker Light Switch(es)

# Control Systems/Dashboard

## Vehicle Controls:

- Steering Wheel
- Clutch
- Accelerator (Gas Pedal)
- Brake Controls:
  - Foot Brake
  - Trailer Brake (if equipped)
  - Parking Brake
  - Retarder Controls (if equipped)
- Transmission Controls
- Interaxle Differential Lock (if equipped)
- Horn(s)
- Windshield Wiper/Washer
- Mirrors & Windshield

# Control Systems/Dashboard

## **Emergency Equipment:**

- Spare Electrical Fuses (unless vehicle as circuit breakers)
- Three Red Reflective Triangles
- Properly Charged & Rated Fire Extinguisher
- Tire Chains
- Tire-Changing Equipment
- Accident-Reporting Kit (Packet)
- List of Emergency Phone Numbers

# Control Systems/Dashboard

## How to read the instrument panel

- Start engine.
- Engage parking brake.
- Put gearshift in neutral (or “park” if automatic).
- Start engine and listen for unusual noises
- If equipped, check the ABS indicator lights. Light on dash should come on and then turn off. If it stays on the ABS is not working properly.

# Control Systems/Dashboard

## Gauges should look like this:

- Oil pressure: Moves to normal within seconds after engine starts.
- Air pressure:
  - Builds from 50 to 90 psi within 3 minutes.
  - Build air pressure to governor cut-out (usually around 120 – 140 psi). Know your vehicles requirements.
- Ammeter and/or voltmeter: Fall within normal range(s).
- Coolant temperature: Gradual rise to normal operating range.
- Engine oil temperature: Gradual rise to normal operating range

# Control Systems/Dashboard

## Seatbelts

- Make sure your seatbelt is secured and pulled tight before driving
- The driver's seat should have a seat belt. Always use it for safety.



# Control Systems/Dashboard

Before driving, make sure your mirrors are in their correct position



# Control Systems/Dashboard

## Mirrors and Blind Spots

- To maximize your vision in your rearview and side mirrors:
  - Adjust the driver's side mirror by resting your head against the driver's side window and moving the mirror so that you barely see the side of your own vehicle
  - Move your head the same distance to the right and repeat with the outside mirror. Now when a vehicle leaves your field of vision from the inside mirror it is picked up by the outside mirrors. This adjustment also helps reduce nighttime headlight glare from behind
- All vehicles have blind spots. You need to know your vehicle's blind spots and be aware of other vehicles' blind spots. As signs on large vehicles often warn, "if you can't see my mirror, I can't see you"
- Regularly checking your mirrors and the road ahead will increase your awareness, improve your recognition time and may speed reaction time

Source: [\*National RTAP. Safety Training and Rural Transit Training Module\*](#)

# Control Systems/Dashboard

## Brakes

- Many buses are equipped with air brake systems that rely on an air supply and release system to actuate the service or parking brake.
- Air storage tanks are filled with compressed air by the compressor, which is powered by the engine.
- When the driver steps on the brake pedal, air flows from the storage tanks into the brake chambers, causing the brake to engage.
- For parking brakes, air is depleted from the system, allowing decompression of springs that cause the parking brake to engage.
- An air pressure gauge located on the dashboard indicates the availability of air pressure for safe vehicle operation, and the system includes warning tones and/or lights to warn of low air pressure.

# Control Systems/Dashboard

## Steering, Accelerating, Shifting, and Parking

- To drive a vehicle safely, you must be able to control its speed and direction. Safe operation of a commercial vehicle requires skills in:
  - Accelerating
  - Steering
  - Shifting gears
  - Braking
- Fasten your safety belt when on the road. Apply the parking brake when you leave your vehicle.
- Do not roll back when you start. You may hit someone behind you. Partly engage the clutch before you take your right foot off the brake. Put on the parking brake whenever necessary to keep from rolling back. Release the parking brake only when you have applied enough engine power to keep from rolling back. On a tractor-trailer equipped with a trailer brake hand valve, the hand valve can be applied to keep from rolling back.
- Review your vehicle's dashboard with your instructor.

# Unit 1.3 Pre-Trip, Enroute, and Post-Trip Inspections

\*Note that the CDL Manual Now Refers to this as "Vehicle  
Inspections"

# Pre-Trip, Enroute, & Post-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

## Enroute Inspections

Throughout the course of the day, do periodic walk-arounds of your vehicle and observe the following:

### Looking for trouble

1. Oil gauges and all warning lights
2. Loss of electrical power
3. Smoke/steam from dash or hood
4. Excessive oil consumption or leaks
5. Exterior light operation
6. Tires/rims/lug nuts

### Listening for trouble

1. Sharp knock when increasing speed
2. Light knock when engine idles
3. Clicking or tapping sound
4. Loud exhaust or engine backfiring
5. Hissing from engine
6. Squealing or grinding from brakes

L-L-S-F

### Smelling trouble

1. Fuel odor
2. Burning rubber or oil
3. Hot brakes or electrical wires
4. Exhaust fumes

### Feeling trouble

1. Excessive vibration in engine/steering wheel/transmission
2. Low or high speed shimmy
3. Pulling left or right when braking
4. Steering is difficult or pulls to either side

Source: [National RTAP. Emergency Procedures for Rural Transit Drivers Training Module](#)

## Pre-Trip, Enroute, & Post-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

- Pre-trip, enroute, and post-trip inspections are essential to a safe trip
- What is your organization's policy regarding inspecting your vehicle?
- Where are the blind spots on the vehicle you drive?
- Proper mirror adjustment: will it eliminate all your blind spots?
- How should you adjust your mirrors?

## Pre-Trip, Enroute, & Post-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

### **Passenger Safety Issue One: Pre-trip Inspection - Prepare for vehicle walk-around**

1. Start the engine & turn on the fast idle.
2. Make sure the transmission is in neutral or park & the parking brake is set.
3. Turn on inside & outside lights & 4-way flashers.
4. Turn on heater or A/C, depending on weather.
5. Briefly test horn & windshield washer/wipers.

*\* It is important to check that the parking brake is working*



## Pre-Trip, Enroute, & Post-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

### FMCSA § 392.7 and § 396.11

This law states that no CMV shall be driven unless the driver is satisfied that the following parts and accessories are in good working order or fail to use these parts when needed

- Service brakes, including trailer brake connections
- Parking (hand) brake
- Steering mechanism
- Lighting devices and reflectors
- Wheels and rims
- Emergency equipment

- Tires
- Horn
- Windshield wiper or wipers
- Rear-vision mirror or mirrors
- Coupling devices

## Pre-Trip, Enroute, & Post-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

### **FMCSA § 392.7 and § 396.11**

Drivers transporting intermodal equipment (like trailers) must additionally inspect the following:

- Lighting devices, lamps, markers, and conspicuity marking material
- Wheels, rims, lugs, tires
- Air line connections, hoses, and couplers
- King pin upper coupling device
- Rails or support frames
- Tie down bolsters
- Locking pins, clevises, clamps, or hooks
- Sliders or sliding frame lock

## Pre-Trip, Enroute, & Post-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

### American Association of Motor Vehicle Administrators (AAMVA)'s Vehicle Inspection Checklist Instructions

"You are only required to inspect the items on the CDL Vehicle Inspection checklist. You may use this checklist for your test and check off items as you have completed them, NO additional markings or writing may be placed on this list. You MUST name, point to and/or touch and fully explain what you are inspecting each safety critical item for. If you do not do so, you will not get credit for the item(s)"

# Pre-Trip, Enroute, and Post-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

## Class A Checklist Tractor Semi-Trailer or Truck & Trailer or Bus & Trailer

### In-Vehicle/Engine Start

- ☐ \*air or \*hydraulic brake check
- ☐ parking & trailer brake check
- ☐ service brake check
- ☐ lighting indicators
- ☐ emergency equipment
- ☐ windshield & traffic monitoring devices
- ☐ wipers & washers
- ☐ heater & defroster
- ☐ horn(s)

### Lights Operations Check

- ☐ all external lights

### Front of Vehicle/Engine Area

- ☐ lenses
- ☐ fluid levels
- ☐ fluid & air leaks
- ☐ steering systems

### Steering Axle

- ☐ tires
- ☐ rims
- ☐ lug nuts
- ☐ springs/mounts & air bags & shocks
- ☐ brake lines or hoses & leaks
- ☐ brake contaminants

### Side of Vehicle

- ☐ lenses & reflectors
- ☐ traffic monitoring devices
- ☐ battery
- ☐ fuel tank(s)/DEF tank
- ☐ frame(s)

### Combination Vehicles Only

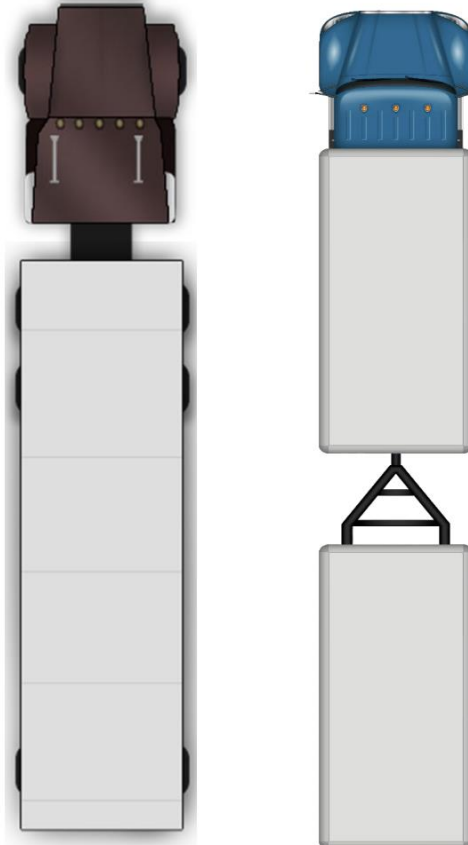
- ☐ air & electric lines & connectors
- ☐ fifth wheel skid plate or pintle hook or tow hitch
- ☐ kingpin & apron & gap or drawbar ring & tongue or coupler & tongue
- ☐ locking & safety devices

### Trailer Only

- ☐ landing gear & clearance
- ☐ reflective tape

### Rear of Trailer

- ☐ lenses & reflectors



From the [Minnesota CDL Manual](#). See the manual for a larger version.

### Passenger and School Bus Only

- ☐ passenger entry & lift
- ☐ emergency exits
- ☐ passenger seating
- ☐ passenger monitoring devices

### School Bus Only

- ☐ student lights (front & back)
- ☐ stop arm(s) & safety arm
- ☐ first aid & body fluid kits

\* Automatic failure if not performed correctly

# Pre-Trip, Enroute, and Post-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

## Class B or Class C Checklist Straight Truck or Other Straight Vehicle

### In-Vehicle/Engine Start

- ☐ \*air or \*hydraulic brake check
- ☐ parking & trailer brake check
- ☐ service brake check
- ☐ lighting indicators
- ☐ emergency equipment
- ☐ windshield & traffic monitoring devices
- ☐ wipers & washers
- ☐ heater & defroster
- ☐ horn(s)

### Lights Operations Check

- ☐ all external lights

### Front of Vehicle/Engine Area

- ☐ lenses
- ☐ fluid levels
- ☐ fluid & air leaks
- ☐ steering systems

### Steering Axle

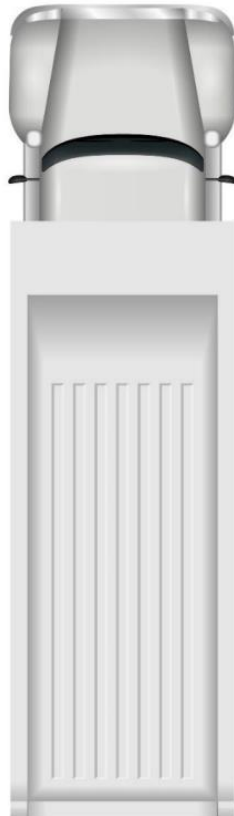
- ☐ tires
- ☐ rims
- ☐ lug nuts
- ☐ springs/mounts & air bags & shocks
- ☐ brake lines or hoses & leaks
- ☐ brake contaminates

### Side of Vehicle

- ☐ lenses & reflectors
- ☐ traffic monitoring devices
- ☐ battery
- ☐ fuel tank(s)/DEF tank
- ☐ frame(s)

### Rear of Vehicle

- ☐ lenses & reflectors



From the [Minnesota CDL Manual](#). See the manual for a larger version.

# Pre-Trip, Enroute, & Post-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

## Class B or Class C Checklist Passenger or School Bus

### In-Vehicle/Engine Start

- ☐ \*air or \*hydraulic brake check
- ☐ parking & trailer brake check
- ☐ service brake check
- ☐ lighting indicators
- ☐ emergency equipment
- ☐ windshield & traffic monitoring devices
- ☐ wipers & washers
- ☐ heater & defroster
- ☐ horn(s)

### Passenger and School Bus Only

- ☐ passenger entry & lift
- ☐ emergency exits
- ☐ passenger seating
- ☐ passenger monitoring devices

### School Bus Only

- ☐ student lights (front & back)
- ☐ stop arm(s) & safety arm
- ☐ first aid & body fluid kits

### Lights Operations Check

- ☐ all external lights

### Front of Vehicle/Engine Area

- ☐ lenses
- ☐ fluid levels
- ☐ fluid & air leaks
- ☐ steering systems

### Steering Axle

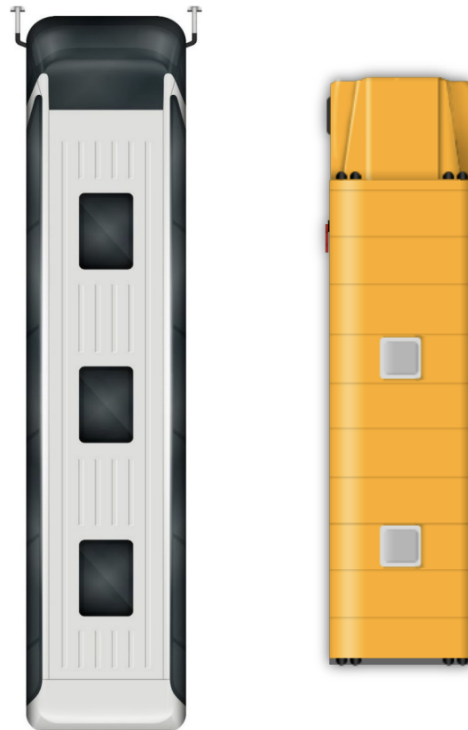
- ☐ tires
- ☐ rims
- ☐ lug nuts
- ☐ springs/mounts & air bags & shocks
- ☐ brake lines or hoses & leaks
- ☐ brake contaminants

### Side of Vehicle

- ☐ lenses & reflectors
- ☐ traffic monitoring devices
- ☐ battery
- ☐ fuel tank(s)/DEF tank
- ☐ frame(s)

### Rear of Vehicle

- ☐ lenses & reflectors



From the [Minnesota CDL Manual](#). See the manual for a larger version.

## Pre-Trip, Enroute, & Post-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

### Basic Pre-trip Inspection

1. Check the overall appearance of the coach when approaching
2. Review the previous trip vehicle inspection report
3. Conduct a walk-around inspection
4. Check the headlights, auxiliary lights, and four-way flashers
5. Check the stop lights and turn signals
6. Check the engine compartment
7. Adjust the seat/mirrors and inspect the interior compartment
8. Air-brake system check

## Pre-Trip, Enroute, & Post-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

### Check the Overall Appearance

As you approach the bus, note its general condition.

- Do you notice any damage?
- Is it leaning to one side?
- Is there anything hanging from underneath?

Look under the bus for any fresh fluids. If fresh fluid is observed under the engine area, a leak can be further investigated/confirmed by inspecting the engine compartment. If you see any confirmed leaks or suspicious fresh fluid puddles, try to determine the fluid type and have the leak evaluated by a mechanic or supervisor.



## Pre-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

### **Review the Previous Trip Vehicle Inspection Report (VIR)**

- Check the previous VIR and make a mental note of any reported defects or issues – you will be checking the status of these during the rest of your inspection. Any safety-related defects must be corrected before the vehicle is used again and any repairs performed should be accompanied by the mechanic's signature.
- After verifying that any safety deficiencies have been repaired, you must sign the appropriate area at the bottom of the VIR (Driver's Signature).

## Pre-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

### Conduct a Walk-Around Inspection

- Enter the vehicle and unlock all luggage bays (if applicable). Exit the coach, checking to see that the stairwell is clear of debris. Once outside, check to see that the door(s) opens and closes properly.
- Check to make sure the mirror support brackets are firmly fixed.

## Pre-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

### **As you walk around the bus, check:**

- The condition of each tire and wheel.
- Each tire to ensure it is not flat.
- Loose or missing lug nuts, rust marks, and cracked wheels
- For oil on tires or wheels
- Cuts, bulges, cracks, not enough tread, or uneven tread wear on the tires
- Loose or separated treads
- All auxiliary lights and reflectors are clean and not broken.

## Pre-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

Check the windshield for cleanliness and damage. Allowable conditions:

- Any crack not over 1-inch wide, as long as it's not intersected by any other crack.
- Any damaged area that can be covered by a quarter, as long as it's more than three inches from any other damaged area.
- Check the spring tension on the wiper arms and check the wiper blades for damage and signs of age (stiff rubber).
- Check each luggage and service access bay for unusual objects or packages, utilizing door pins or other locking mechanisms when present to ensure the bay doors remain open. Check door operation in the process.

## Pre-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

Check the exterior safety equipment:

- Spare tire
- Tire chains or similar traction aides (if needed)
- Reflective triangles (three) and spare fuses (if not kept inside passenger compartment)

As you walk around the bus, check for damages or missing parts.

If you find a problem during any of the above checks, have the condition checked/fixed if it would affect the safe operation of the bus. You should not use a bus that is not in safe operating condition.

## Pre-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

### **Check Headlights, Auxiliary Lights and Four-way Flashers**

- With the engine off and the parking brake on, turn on your four-way flashers, headlights, and all auxiliary lights (parking, clearance and identification lights).
- Exit the coach, checking the operation of the stairwell and landing lights. Walk around the coach and check to see operation of all the headlights, tail lamps, four-ways and auxiliary lights. Go back inside and, watching the light patterns in front of the coach, toggle your high beams to ensure they are operational.

## Pre-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

### Check the Engine Compartment

- Check the overall condition of the belts and hoses. Are any of the belts loose or frayed? Are any of the hoses cracked, loose, or rotting?
- Look for signs of leaking fluids in engine compartment and underneath the coach.
- Check the engine bay for unnecessary or unusual buildup of grease, oil, dirt or other materials that could fuel a potential fire. If the engine is equipped with a fire suppression system, check disbursement nozzles for cleanliness and potential obstruction.
- Locate the alternator. Ensure that all battery cables leading to/from the alternator are secured and not chaffed or free to rub against another component.

## Pre-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

### Check the Engine Compartment (continued)

- With the engine off, check the oil level by taking the dipstick out, wiping it with a paper towel, re-inserting it all the way, and examining the dipstick. If the level is low, oil should be added and a close inspection for leaks should be performed before the trip.
- With the engine turned off, check the coolant level using the sight glass or alternate method. If it is low on a pre-trip inspection, have it serviced and inspect closely for any evidence of leaks.
- Turn the engine on. Check the transmission fluid level after letting the engine idle for at least two minutes.
- CAUTION: Never remove the radiator cap when the engine is hot or has recently been running. Severe steam burns could result.



## Pre-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

- Adjust seat/mirrors and inspect the interior.
- Adjust the seat for yourself and check the seat belt for proper operation.
- After you have adjusted your seat, adjust your mirrors for optimal vision.
- Make sure that the parking brake is on and the gearshift is in “neutral.”
- Turn on the master control switch and ensure the engine is running.
- Operate the windshield wipers and washer. Inspect the windshield for damage.

## Pre-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

- Check the oil pressure. If you have a gauge, you should have pressure immediately; if you have a warning light only, the warning light should go off. If not, shut the engine off; otherwise, leave the engine running. If you have an oil gauge, the oil pressure may not reach its normal level until the engine warms up. Listen for any unusual noises.
- Check the coolant temperature gauge: temperature should begin to climb to the normal operating range. If you only have a coolant temperature warning light, the light should go off.
- Check the voltmeter/battery gauge to see that alternator is charging. If you only have a battery/alternator warning light, the light should go off.

## Pre-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

- Check that the air pressure gauge indicates that air pressure is building
- Check that the coach's heating, air conditioning, defroster and ventilation system is working properly.
- Check the public-address system and adjust as necessary.
- Test your horn.
- Check the play in your steering wheel. As you turn the wheel left and right, you should feel tension after turning the wheel 1 to 2 inches. Listen for unusual noises.
- Check the instrument and other panels for any warning lights, such as anti-lock braking system (ABS), tire pressure monitor, etc.
- Release and re-apply the parking brake.

# Pre-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

## Check Emergency Equipment

- Check the fire extinguisher for proper mounting and charge.
- Locate emergency triangles and spare fuses (if these are kept in a storage area outside/under the coach, they should be checked during the exterior walk-around).
- Check the passenger seats and seat belts (if equipped) for damage.
- Check that emergency exit windows and roof hatches are marked and releases are functional. Re-secure any unlatched emergency exit windows and hatches.
- Check each overhead rack (if so equipped) and areas under seats for any suspicious objects or packages.
- Check the restroom for damage, cleanliness and supplies, such as toilet tissue and paper towels. Check the restroom door lock and “occupied” sign.

# Pre-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

## Check the Air Brake System

Brakes are a critical safety component. If any of the following tests are not passed, be sure the condition is corrected before starting your trip.

*When conducting brake system checks, be sure the coach is on a flat surface, as there will be times when no brakes are engaged. If the coach is not or cannot be located on a flat surface, wheel chocks should be used from the beginning of the system check until just prior to the “parking brake test”.*

## Pre-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

### Static Leakage Test

Place the transmission in neutral, apply the parking brake (if not already applied) and stop the engine. Take note of the air pressure reading and wait for one minute - the air pressure must not drop more than 2 psi during this minute. Now release the parking brake and wait another minute. The air pressure gauge must not drop more than 2 psi in this second minute. Reapply the parking brake.

### Applied Leakage Test

With the engine still off and the parking brake released, apply the service brake firmly and hold. The initial drop in air pressure must not be more than 10 psi. After the system settles (needle stops moving) continue to hold the pedal down for one full minute. The pressure should not drop by more than 3 psi in this minute. Re-apply the parking brake.

# Pre-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

## Low Air Warning System Test

The purpose of this test is to be sure that the low-air pressure warning system is functioning properly.

With the engine still off, release the parking brake, apply and release the service brake repeatedly to reduce the air pressure. When the air pressure gauge reaches 80 psi, turn on the master control switch, but do not turn on the engine. Continue reducing the air pressure until the low air pressure warning light and buzzer come on. This should occur between 75 psi and 55 psi.

## Pre-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

### Emergency Brake Test

Next, continue reducing the air pressure. When the system air pressure reaches about 20 psi, the parking brake knob should “pop out” to indicate that the emergency brake system has activated the spring/parking brake.

### Air Pressure Build-Up Test

Start the engine - the air pressure should begin building. Let the air pressure build up until the low air pressure warning buzzer stops. Continue to let the air pressure build. It should not require more than about one minute for the air pressure to go from discharged (5-20 psi) up to between 120 and 130 psi.



# Pre-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

## **Governor Cut-Out Test**

When the pressure has climbed to between 120 and 130 psi, the governor should cause the air compressor to cut out. When it cuts out, the compressor sound will stop, and the gauge needle will stop moving.

## **Governor Cut-In Test**

Reduce the air pressure by making applications of the service brake. Before the pressure drops below 85 psi, the compressor should cut-in and begin to build air into the system.

# Pre-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

## Parking Brake Test

With the parking brake still engaged, place the bus into gear and try to move the coach – applied parking brakes should keep the coach from moving.

## Service Brake Test

- Release the parking brake and drive forward slowly – the coach should move freely with no brake drag.
- Apply the service brake while holding the steering wheel lightly to determine whether the brakes apply without pulling to either side. Drive forward slowly a third time and apply the service brake gradually to check for smoothness (make sure there is no unusual jerkiness when stopping).

## Enroute Inspections (Referred to as Vehicle Inspections in the CDL Manual)

**If you have interim stops on the way to your final destination check for:**

- Tires/wheels: are there any flats or tires leaking air? Look for signs of hub oil on wheels and check tires/wheels for excessive heat.
- Lights
- Leaks (oil, coolant, etc.)
- Verify all compartments are closed
- Check for damage
- Note obstacles to pulling out/backing out

## Post-Trip Inspections (Referred to as Vehicle Inspections in the CDL Manual)

- At the end of your trip, you may need to document your trip and any defects discovered during your pre-trip, enroute or post-trip inspection on a Driver Vehicle Inspection Report (DVIR). This varies by industry and agency.
- At a minimum you would note the condition of the following on your report:
  - Service Brake
  - Parking Brake
  - Steering Mechanism
  - Lighting Devices & Reflectors
  - Tires
  - Wheels & Rims
  - Mirrors
  - Horn
  - Windshield Wipers
  - Emergency Equipment

# Cycling Accessible Lifts

Video: [How to Operate a Wheelchair Lift.](#) Braun—15:47 minutes



# Cycling Accessible Lifts

- Cycle the lift or ramp, checking for smooth operation
- Inspect the securement system, including floor tracks, anchorages, straps/tie-downs, seat belts and folding seats to ensure necessary components are present and functional

*\* If lift is not operational, check with dispatch to determine if you must change buses*



# Unit 1.4 Basic Control

*This unit satisfies FMCSA's ELDT requirements for units A1.1.4, BA.1.1.4, and B1.1.4*

# Basic Control

**Basic control of your vehicle requires safe operation of a commercial vehicle requires skill in:**

**Accelerating:**

- Speed up smoothly and gradually, so the vehicle does not jerk. Rough accelerating can cause mechanical damage.
- When pulling a trailer, rough acceleration can damage the coupling. Speed up gradually when you have poor traction. If you use too much power, the drive wheels will spin, and you could lose control.
- If your drive wheels begin to spin, take your foot off the accelerator. Do not roll back when you start. If you have a manual transmission partly engage the clutch before you take your right foot off the brake.
- Put on the parking brake whenever necessary. Release the parking brake only when you have applied enough engine power to keep the truck from rolling backwards. You may also use the hand valve on a tractor trailer to prevent you from rolling backwards.



# Basic Control

**Basic Control of Your Vehicle requires safe operation of a commercial vehicle requires skill in (continued):**

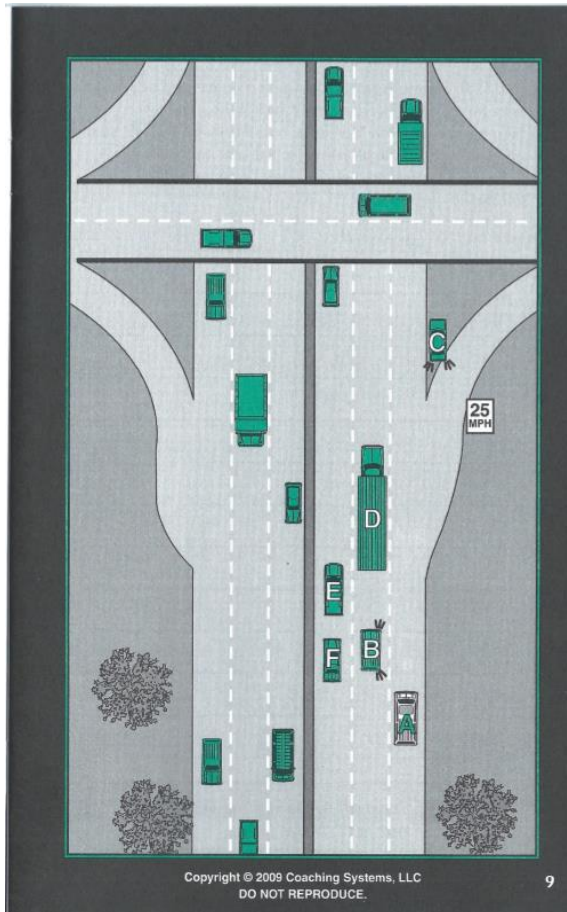
- **Steering:** Hold the steering wheel firmly with both hands. Your hands should be on opposite sides of the wheel. If you hit a pothole, the wheel could pull away from your hands unless you have a firm hold.
- **Stopping:** Push the brake pedal down gradually. Control the brake pressure so the vehicle comes to a smooth, safe stop. The amount of brake pressure you need will depend on your speed and how quickly you need to stop.
- **Backing Safely:** Backing is always dangerous. Avoid it whenever you can. You want to plan ahead before you park. Try to park so you'll be able to pull forward when you leave.

# Basic Control — Executing Sharp Turns

Video: [Making Turns Safely](#). FirstFleet—4:37 minutes



# Basic Control



In this situation these drivers are on a multi lane highway. What are the hazards (if any) that A is facing what should A do to minimize the risk?

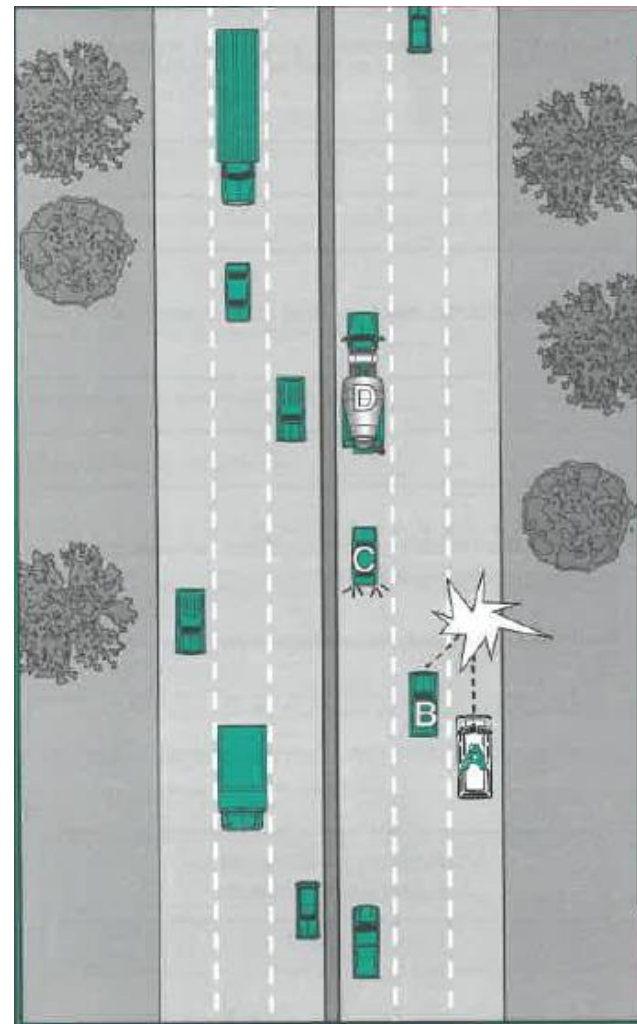
- If Exiting:
- If continuing on the Highway:

# Basic Control

In this situation “A” was driving on a multi-lane highway with no other vehicles in front or behind. The driver of “B” pulled right into “A’s” lane colliding with A.

A said they couldn’t do anything to prevent the collision.

How would have you handled this situation?



# Basic Control

- How can “covering the brake” assist you?
- What components make up your total stopping distance?
- What are the variables for each of the components of your total stopping distance?

# Basic Control

1. When traveling in ideal conditions \_\_\_\_\_

2. You should assume that you are in another driver's blind spot \_\_\_\_\_

3. You should check your mirrors \_\_\_\_\_

4. In adverse weather conditions \_\_\_\_\_

5. A preventable collision is \_\_\_\_\_

**a** - you should increase your following distance.

**b** - your following distance should be at least 4 seconds.

**c** - if you can not see the vehicle's inside mirror.

**d** - one in which the driver failed to do everything reasonable to avoid it.

**e** - every 3 to 5 seconds.

# Basic Control

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- What is owning the intersection?
- Should you ever wave another driver through an intersection?
- Who has the right of way?
- What is the proper way to stop at a stop sign?

## Basic Control- Maneuvering in Restricted Areas

**Roadway Work Zones:** Speeding traffic is the number one cause of injury and death in roadway work zones. When possible, avoid work zones and use any detours that are available. When you must drive through a work zone:

- Pay attention. Be aware of all signage throughout work zones that can indicate reduced speeds, lane changes and other important information. Avoid distractions. Scan ahead for changing traffic patterns and be alert to vehicles entering your blind spots.
- Slow down and be prepared to stop. Keep a sharp eye out for road workers and flag crews. Decrease your speed even further when a worker is close to the roadway. Don't allow your speed to creep up as you drive through long sections of road construction. Decrease your speed for adverse weather or road conditions.
- When approaching lane closures, move into the open lane as soon as possible. Be sure to pay close attention to vehicles around you that could be in your blind spot.



## Basic Control – Centering the vehicle

- Keep in mind positioning a large truck is different than a car. In many cases, the back may be wider than the cab, so you need to position yourself accordingly.
- Use your mirrors to determine whether you are properly positioned in your lane. Watch that each side of your vehicle is equal distance to the lines on the road.
- In poor visibility where you cannot see roads, err on the side of caution by driving closer to the left side of the lane if possible. This is especially important if there is a lot of snow on the ground, as you will not be able to see how wide the shoulder is and whether there is a steep pavement drop-off. Once you have a hard time gaining control of the vehicle, especially in winter.
- Beware of high winds! If you are driving in an area prone to wind tunnels or during bad weather, you need to pay extra attention to your lane positioning. Be especially alert on bridges, overpasses and when driving next to another large vehicle that may be temporarily blocking the wind.

# Unit 1.5 Shifting/Operating Transmissions

*This unit satisfies FMCSA's ELDT requirements for units A1.1.5, BA1.1.5, and B1.1.5.*

# Shifting/Operating Transmissions

Video: [CDL Shifting & Down Shifting](#). Dootson School of Trucking—7:56 minutes



# Shifting/Operating Transmissions

- Correct shifting of gears is important to maintaining vehicle control and improved fuel economy
- Most heavy vehicles with unsynchronized manual transmissions require double clutching to change gears. If equipped with a synchronized manual transmission, double clutching is NOT required. This is the basic method:
  - Release accelerator, push in clutch and shift to neutral at the same time.
  - Release clutch.
  - Let engine and gears slow down to the rpm required for the next gear (this takes practice).

# Shifting/Operating Transmissions

## Shifting an Unsynchronized Manual Transmission (Continued)

- Push in clutch and shift to the higher gear at the same time.
- Release clutch and press accelerator at the same time.
- Shifting gears using double clutching requires practice. If you remain too long in neutral, you may have difficulty putting the vehicle into the next gear. If so, don't try to force it. Return to neutral, release clutch, increase engine speed to match road speed and try again.

# Shifting/Operating Transmissions

## There are two ways of knowing when to shift:

- Use **Engine Speed (rpm)**. Study the driver's manual for your vehicle and learn the operating rpm range. Watch your tachometer and shift up when your engine reaches the top of the range.
  - Some newer vehicles use “progressive” shifting: the rpm at which you shift becomes higher as you move up in the gears. Find out what's right for the vehicle you will operate.
- **Use Road Speed (mph)**. Learn what speeds each gear is good for. Then, by using the speedometer, you'll know when to shift up.
- With either method, you may learn to use engine sounds to know when to shift.
- Push in clutch and shift to the higher gear at the same time.

# Shifting/Operating Transmissions

## Basic Procedures for Shifting Down

- Release accelerator, push in clutch and shift to neutral at the same time.
- Release clutch.
- Press accelerator, increase engine and gear speed to the rpm required in the lower gear.
- Push in clutch and shift to lower gear at the same time.
- Release clutch and press accelerator at the same time.

# Shifting/Operating Transmissions

- Downshifting, like upshifting, requires knowing when to shift. Use either the tachometer or the speedometer and downshift at the right rpm or road speed.
- Downshift:
  - Before starting down a hill. Slow down and shift down to a speed you can control without using the brakes hard. Otherwise, the brakes can overheat and lose their braking power. Make sure you are in a low enough gear, usually lower than the gear required to climb the same hill.
  - Before entering a curve. Slow down to a safe speed and downshift to the right gear before entering the curve.



# Shifting/Operating Transmissions

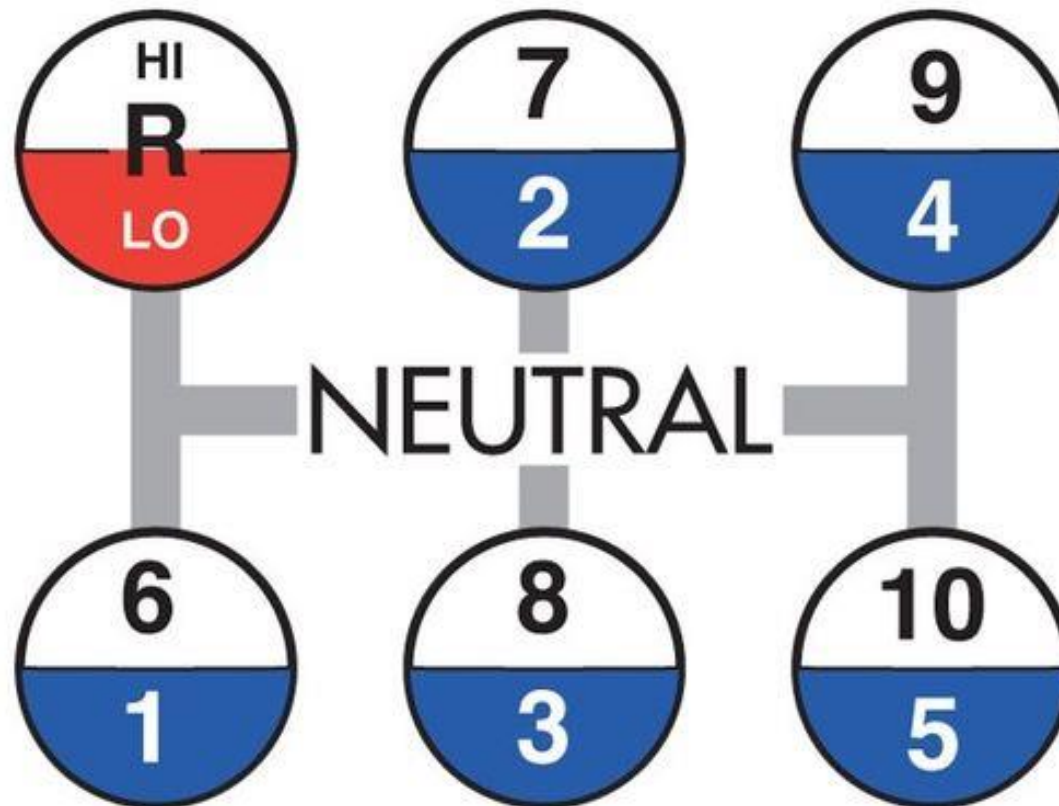
- Multi-speed rear axles and auxiliary transmissions are used on many vehicles to provide extra gears. You usually control them by a selector knob or switch on the gearshift lever of the main transmission. There are many different shift patterns. Learn the right way to shift gears in the vehicle you will drive.

Source: <https://www.wikihow.com/Shift-a-Semi-Truck>

# Shifting/Operating Transmissions



# Shifting/Operating Transmissions



**10 Speed Shift Pattern**



# Unit 1.6 Backing and Docking

*This unit satisfies FMCSA's ELDT requirements for units A1.1.6, BA1.1.6, and B1.1.6.*

# Parking Lots

- Use extra caution in parking lots.
  - Often, other drivers disregard the common rules of the road when in parking lots.
  - Proceed slowly, scan around your vehicle, and be ready to sound horn.
- When parking, leave yourself an out.

# Docking

## **G.O.A.L. = Get Out And Look**

- Always have a good look at the docking area and the surrounding area before setting up to commence backing up.
- Look for obstacles, especially things that are below the site line. These things will most likely not be visible in the mirrors, once the driver starts to back up.

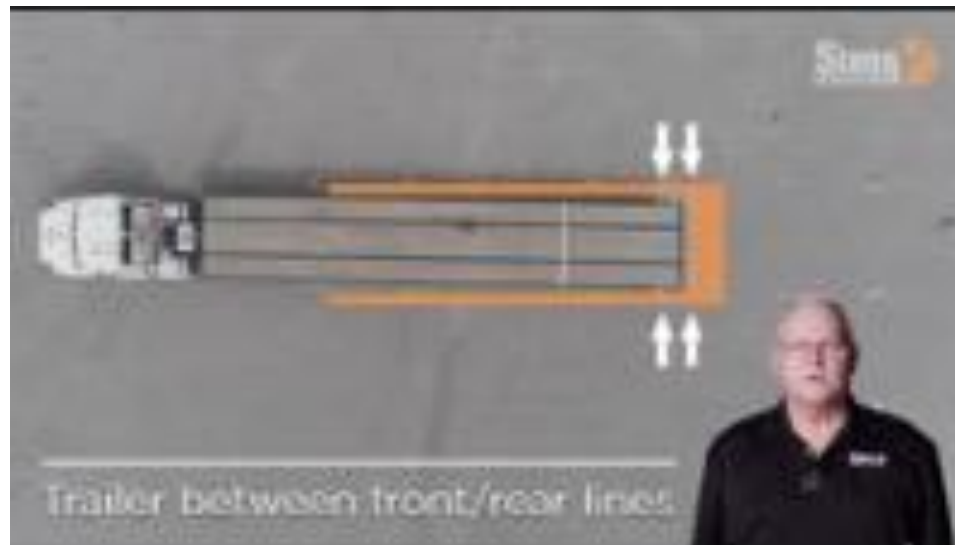
B

A

B→A

## Docking — Alley Docking (Now Referred to as Backing in the CDL Manual)

Video: [Alley Docking](#). Sims University—2:19 minutes



# Docking

- Setting up for a dock is an important skill for new drivers
- Positioning the truck correctly is essential to successful alley docking.\*
- If the truck isn't positioned correctly, it can be nearly impossible to do a 45 degree back up maneuver, and the risk of incurring damage to equipment or property escalates!
- **THE MOST DIFFICULT PROFESSIONAL DRIVER SKILL – BACKING UP THE TRUCK**

*\*The CDL manual now refers to alley docking as backing.*



# Docking

## Three rules to consider when preparing to alley dock\*

1. Exit the truck to look multiple times
2. Ask for parked cars or obstacles to be moved.
3. Refuse to back into an impossible setting.

## Don't let pride and embarrassment get in the way.

- It's not easier to try it without following the rules.
- If you mess up and hit something, the scars on your driving record which is bad news.
- They could save you from worse embarrassment if you rip the bumper off a car or tear the front end off an expensive rig!

*\*The CDL manual now refers to alley docking as backing.*

# Types of Backing Set-ups

Video: [Driver Training Series: Backing Techniques](#). J. J. Keller & Associates, Inc.—8:47 minutes



# Backing & Docking

**Backing the vehicle can be very dangerous and should only be done when absolutely necessary.**

- If you must back:
  1. If possible, get out of the vehicle to assess any hazards/obstacles. G.O.A.L. = Get Out And Look!
  2. Use an adult spotter to alert you to possible hazards
  3. Check carefully in all directions, including the rear
  4. Turn on four-way flashers
  5. Honk the horn in short continuous beeps while in motion
- Mirrors and a spotter do not relieve you of the responsibility to back the vehicle safely. Backing up should only be done if there is no alternative.
- If possible, pull through and use the forward stall when parking, this will prevent you from having to back up when you leave.

Source: [\*National RTAP. Safety Training and Rural Transit Training Module\*](#)

# Using a Spotter to Back Up

- The driver and the spotter should discuss the proposed maneuver before the driver begins and use highly visible and obvious hand signals at all times. Hand signals should be agreed upon prior to the commencement of the maneuver.
- The spotter should maintain eye contact with the driver's eyes in the mirror even if this requires changing position frequently.
- The spotter should continue to signal even when the driver's maneuver is unchanging or proceeding normally. Don't signal just when something different needs to happen or when the driver needs to stop.
- If the spotter needs to stop spotting momentarily for any reason, make sure the driver stops the vehicle. Resume the maneuver only after spotting is resumed.
- Maintain a safe distance or position from the vehicle while spotting and make sure there aren't any obstructions to your walking path prior to beginning the maneuver.

## Using a Spotter to Back Up

- Use hand signals, not verbal signals. However, in an emergency the spotter may supplement hand signals with a verbal warning.
- If the driver is unclear at any point about the spotter's signals the vehicle should be stopped immediately. Resume the maneuver when the driver and spotter have clarified the signals.
- The vehicle should be stopped while the driver is looking away from the spotter for any reason including checking the other mirror.
- When spotting, concentrate on spotting, not talking to someone in the vicinity.

# Using a Spotter to Back Up

## OSHA Suggested Spotting Signals

Suggested Spotting Signals



Back up



Back, turn left



Back, turn right



Move Forward



Distance left to back



Slow down



Stop

## Skid Control/Recovery, Jackknifing, & Other Emergencies

### **How to respond to brake failure due to loss of hydraulic pressure:**

When the system will not build up pressure, the brake pedal will feel spongy or go to the floor. Actions you can try:

- Downshift – A lower gear will help to slow the vehicle.
- Pump the brakes – This may generate enough hydraulic pressure to stop the vehicle.
- Use the parking brake – The parking or emergency brake is separate from the hydraulic brake system. Therefore, it can be used to slow the vehicle. However, be sure to press the release button or pull the release lever at the same time you use the emergency brake so you can adjust the brake pressure and keep the wheels from locking up.

# Skid Control/Recovery, Jackknifing, & Other Emergencies

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## Find an Escape Route

- While slowing the vehicle, look for an escape route — an open field, side street or escape ramp. Turning uphill is a good way to slow and stop the vehicle. Make sure the vehicle does not start rolling backward after you stop. Put it in low gear, apply the parking brake and, if necessary, roll back into some obstacle that will stop the vehicle.



# Unit 1.7 Coupling and Uncoupling

*This unit satisfies FMCSA's ELDT requirements for units A1.1.7 and BA1.1.7.*

# Coupling & Uncoupling

Video: [Coupling & Uncoupling: Driver Training Series](#). J. J. Keller & Associates, Inc.—7:12 minutes





## Section 2: Safe Operating Procedures



# Unit 2.1 Visual Search

*This unit satisfies FMCSA's ELDT requirements for units A1.2.1, BA1.2.1, and B1.2.1*

# IPDE Method

The four-step process of the I.P.D.E. Driving Method is designed to help you see, think and act in all situations.

## **I**= Identify

As you drive, look for and identify potential hazards such as other vehicles, wildlife in the roadway, signs and signals, etc.

## **P**= Predict

Use your experience, knowledge, and judgement to predict what will happen next. Judge where and when possible accidents may occur.

I.P.D.E.

## **D**= Decide

When hazards appear in your path, you must decide quickly how to react in order to avoid the obstacle or minimize its impact.

## **E**= Execute

Once you have decided upon a course of action, you must execute quickly and decisively to keep you and others safe.

Source: [National RTAP. Safety Training and Rural Transit Training Module](#)

# Visual Search

## Pedestrians

- When driving, it is important to remember that you're sharing the road. Tips to raise your awareness of pedestrians:
- **Watch for children dashing out into traffic:** Cover the brake, drive slowly, and be ready to stop
- **Yield to pedestrians at marked and unmarked crosswalks:** On multi-lane roadways, if you come too close to a pedestrian, you may block the next driver from seeing the pedestrian and he/she is crossing the roadway.
- **Don't pass vehicles stopped at crosswalks:** and be prepared to stop for pedestrians who are walking in marked on unmarked crosswalks

*Source: National RTAP| Information taken directly from "Sharing the Road with Pedestrians: A Guide for Motorists and Pedestrians" © 2011 Arizona DOT, created by Pima County (AZ) Bicycle and Pedestrian Program, Matthew Zoll, Program Manager.*

# Visual Search

## Pedestrians (continued)

- **Yield to pedestrians when making turns:**
  - Left turns: scan the cross-walk before turning and be aware that your windshield may partially block your view
  - Right turns: Where allowed, only make a right turn on red after coming to a complete stop.
- **Exit driveways slowly and carefully:** Expect pedestrians on the sidewalk, especially near schools, commercial areas, and neighborhoods.
- **Watch for pedestrians along the roadway:** This is especially important if you are driving on a street with no sidewalks

*Source: National RTAP| Information taken directly from “Sharing the Road with Pedestrians: A Guide for Motorists and Pedestrians” © 2011 Arizona DOT, created by Pima County (AZ) Bicycle and Pedestrian Program, Matthew Zoll, Program Manager.*

# Visual Search

## Pedestrians (continued)

- **Yield to pedestrians in parking lots:** Remember that your vehicle can do a lot of damage even only at 5mph.
- **Obey signals at a pedestrian hybrid beacon:** These signals remain off until a pedestrian presses a button. Flashing or solid yellow means prepare to stop, followed by a solid red meaning stop. Flashing red means stop or remain stopped until the pedestrian has crossed the street.
- **Laws vary from state to state,** so make sure you're familiar with local laws about pedestrian safety.

*Source: National RTAP| Information taken directly from "Sharing the Road with Pedestrians: A Guide for Motorists and Pedestrians" © 2011 Arizona DOT, created by Pima County (AZ) Bicycle and Pedestrian Program, Matthew Zoll, Program Manager.*



# Visual Search

## Sharing the Road with Bicyclists

- Bicyclists have the right to ride in the street (the extent varies by state), even with no marked bike lanes
- Bicyclists tend to position themselves to the right of the faster moving traffic, which means they constantly cross paths with buses pulling over to make stops.
- You shouldn't drive in bike lanes, unless you are pulling into a service area or making a turn. In both situations, always use your turn signal and check your mirrors. If there is a cyclist riding parallel to you, slow down to let him/her get ahead of the bus before you pull over.

*Source: National RTAP, information taken directly from “Share the Road — Buses and Bicycles” video by Chicago Transit Authority and Chicago DOT.*

# Visual Search

## Sharing the Road with Bicyclists

- You shouldn't drive in bike lanes, unless you are pulling into a service area or making a turn. In both situations, always use your turn signal and check your mirrors. If there is a cyclist riding parallel to you, slow down to let him/her get ahead of the bus before you pull over.
- Even when car traffic backs up, bicyclists usually still have a clear path and can be traveling quickly.
- When passing a cyclist, travel at a steady speed and remain at least 3 feet away from the cyclist, more if traffic allows. If there is not enough room to pass, slow down until it is safe.

*Source: National RTAP, information taken directly from "Share the Road — Buses and Bicycles" video by Chicago Transit Authority and Chicago DOT.*

# Visual Search

## Sharing the Road with Bicyclists

- At intersections, yield to merging cyclists when the bike lane ends and watch for cyclists that move to wait at the front of the line of traffic during a red light.
- When making a left turn, oncoming traffic can hide cyclists. Once oncoming traffic clears, pause before turning to ensure there are no cyclists in your path.
- Check sidewalks for children on bicycles.
- Always assume a cyclist could be there and check!
- Bicycling laws vary from state to state so check your local laws.

*Source: National RTAP, information taken directly from “Share the Road — Buses and Bicycles” video by Chicago Transit Authority and Chicago DOT.*

## #3 Keep your Eyes Moving ®

- Peripheral vision is 180°
- Central cone vision is 3°
- Blank and fixed stares
- Keep your eyes moving every 2 seconds

## #3 Keep your Eyes Moving ®

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- Don't fixate
- Scan the entire area
- Don't forget the front, sides and top
- Back slowly

# Personal Safety for Truck Drivers

- Be aware of your surroundings, especially at night. Stick to well-lit areas and plan your routine to limit the time you spend outside your truck when it is dark outside.
- Keep your cell phone charged and with you, so you may call for help.
- Drive slowly so you can easily stop if someone gets in your path.
- Avoid parking on the ends of rows, where it tends to have more moving traffic and where tired drivers who may not see you are likely to park.
- Park near other trucks because there is safety in numbers.
- Inspect your truck before you move out. Walk around your vehicle before leaving the truck stop to be sure no one has tampered with your truck when you were away from it.
- Secure your load and don't talk about what you are hauling in public. This helps keep your cargo safe and secure. Use a padlock on the door or ratchet strap to secure cargo.

# Personal Safety for Truck Drivers

- Do your research ahead of time. Check truck stop reviews. Select stops that take extra security measures, such as using security cameras or hiring overnight security guards. Be aware that in some states overnight and extended stays are illegal at rest stops.
- Protect yourself. Check the rules of carrier for what weapons and safety tools can be used. Pepper spray and even a heavy-duty flashlight can come in handy.
- Lock your doors, when you step away from the vehicle AND when you are inside. Keep blinds closed to keep you and your possessions out of sight.
- Follow social distancing recommendations and health precautions.
- Shipper/Receiver locations: Contact the shipping or delivery location ahead of time to get the most current and timely conditions and ask about any safety issues in the area that might be present. If you are stopped by a crowd or protest, stay in the truck and safely keep moving, slowly. **Call 911 for help.** You have every right to assume people assaulting you in your vehicle present a danger.



# Unit 2.2 Communication

*This unit satisfies FMCSA's ELDT requirements for units A1.2.2, BA1.2.2, and B1.2.2*



# Communication

Other drivers can't know what you are going to do until you tell them.

## **Turn Signals — Rules for Using Them**

- Signal early
- Signal continuously
- Cancel your signal

## **Lane Changes**

- Put your turn signal on before lane changes.
- Change lanes slowly and smoothly

## **Slowing Down**

- Warn drivers when you need to slow down. Light taps on the brake pedal should warn drivers. If you're driving very slowly or stopped, use emergency four-way flashers

# Communication

## When to Warn Other Drivers

- **Trouble Ahead:** The size of your vehicle may make it hard for drivers behind you to see hazards ahead. If you see a hazard that will require slowing down, warn the drivers behind by flashing your brake lights.
- **Tight Turns:** brake early and slow gradually so other drivers know you're about to turn.
- **Stopping on the Road:** warn others by flashing your brake lights. Don't stop suddenly.
- **Driving Slowly:** Alert drivers with your emergency flashers if you need to drive very slowly.

# Communication

**Use Your Horn When Needed.** Your horn can let others know you're there. It can help to avoid a crash. Use your horn when needed. However, it can startle others and could be dangerous when used unnecessarily.

## Proper use of headlights

- Do not “flash” your high beam lights at oncoming traffic because it can blind the oncoming driver and increases the chance of an accident.
- Use low-beam headlights when it is cloudy, raining, snowing, or foggy.
- It is a good idea to drive with your headlights on, even on sunny days. This will help other drivers see you.
- Use your hazard lights (also called emergency flashers) to show a hazard or collision is ahead or if you are having trouble with your vehicle.

# Communication

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## **Proper use of eye contact.**

When Confronted by an Aggressive Driver: Avoid direct eye contact.

Make eye contact with pedestrians and bicyclists to indicate that you see them. This does not guarantee that they see you. Always be prepared to for them to do the unexpected and be prepared to stop.



# Unit 2.3 Distracted Driving

*This unit satisfies FMCSA's ELDT requirements for units A1.2.3, BA1.2.3, B1.2.3, and C1.13*

# Distracted Driving

## **FMCSRs prohibit the use of cellphones and texting while driving**

- The rule applies to interstate truck and bus drivers and drivers who transport placardable quantities of hazardous materials.

### **What's prohibited:**

- Texting, defined as entering alphanumeric text into, or reading text from, an electronic device. This includes, but is not limited to, short message service, e-mailing, instant messaging, a command or request to access a Web page, or pressing more than a single button to initiate or terminate a voice communication using a mobile phone or engaging in any other form of electronic text retrieval or entry, for present or future communication.

# Distracted Driving

## **FMCSRs prohibit the use of cellphones and texting while driving**

This [rule](#) restricts a CMV driver from reaching for or holding a mobile phone to conduct a voice communication, as well as dialing by pressing more than a single button. CMV drivers who use a mobile phone while driving can only operate a hands-free phone located in close proximity.

# Distracted Driving

## **What happens if a driver is caught using a hand-held phone or texting while driving?**

The [rule imposes sanctions](#) for driver offenses, including civil penalties up to \$2,750 and driver disqualification for multiple offenses. Motor carriers are also prohibited from requiring or allowing their drivers to text or use a hand-held mobile phone while driving and may be subject to civil penalties up to \$11,000. Violations will impact SMS results. Texting and calling on a hand-held phone carry the maximum violation severity weighting.



# Distracted Driving

## Types of Distractions

- Visual Distractions: Takes eyes off the road
- Manual Distractions: Takes hands off the wheel
- Cognitive Distractions: Takes mind away from safe operation

Simply put...

Anything that takes your eyes off the road is a distraction.

# Distracted Driving

## Self-Created Distractions

- Texting
- Speaking on your cell phone
- Adjusting seat positions while driving
- Adjusting climate controls
- Adjusting interior mirrors
- Using vehicle mirrors for personal grooming
- Eating and/or drinking
- Singing with the radio, CD, or other audio

# Distracted Driving

## Company Created Distractions:

- Communication radios
  - Does your company require you to respond to dispatch while you are driving?
- Cell phones, if your company uses them in place of standard communications equipment
- Fare boxes
- Destination signs

# Distracted Driving

## **Distractions created outside of your vehicle:**

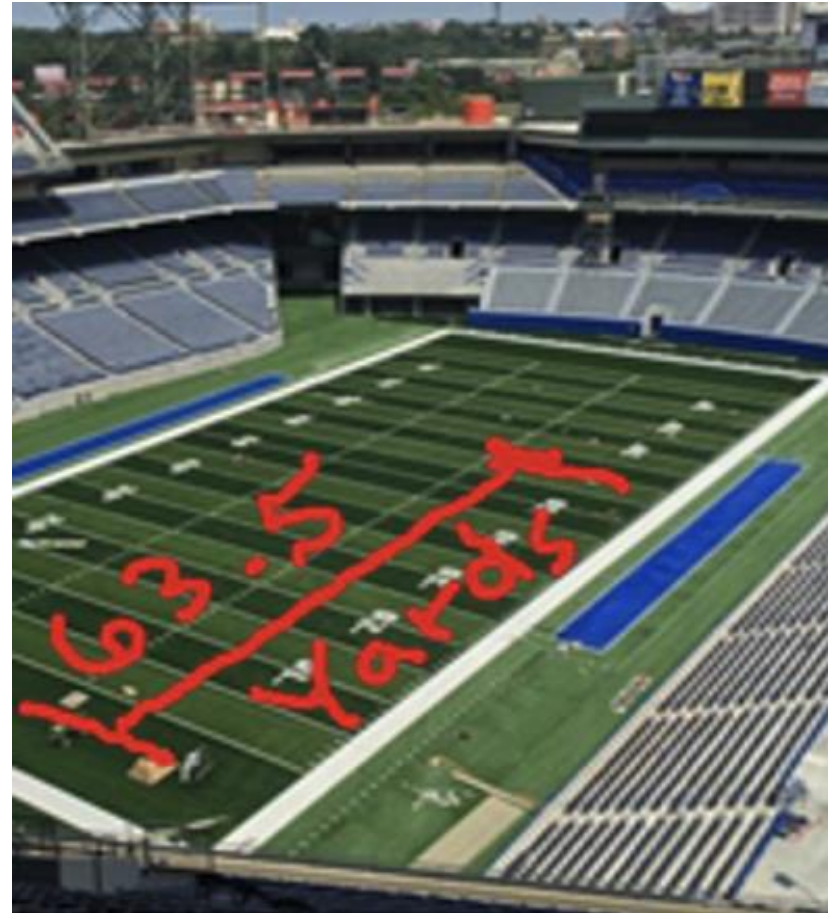
- Operating at high speed
- Calculating speeds and distances
- Responding to other drivers and obstacles
- Pedestrians
- Bicyclists
- Looking for addresses

# Why is this important?

# Distracted Driving

**If you take your eyes off the road for 2 seconds at 65 mph**

- Traveling at 95.33 feet per second for two seconds means you travelled
  - 190.66 feet
  - 63.5 yards
  - Nearly two-thirds length of a football field



# Distracted Driving

- Sending or reading a text takes your eyes away from the road on average 4.6 seconds'
- At 65 mph you will have driven the length of 1.2 football fields, BLIND!



# Distracted Driving

## **When you take one hand off the wheel to:**

- Use the two-way radio, cell phone or other on-board equipment (GPS, farebox)
- Adjust the mirror, seat, or climate control
- Secure items in the vehicle
- Eat or drink

**You have GREATLY reduced your response time to anything that happens outside of your vehicle.**



# Distracted Driving

## Let's see what can happen in 5 seconds

Video: [Texting While Driving Caught on Tape](#). Today Show—2:27 minutes



# Distracted Driving

**Here's what the driver was doing:**



# Distracted Driving

Look closely, notice the driver has

- One hand on the wheel
- And the other hand and his eyes on his cell phone



## Defensive Driving

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**Defensive Driving** is driving to  
save lives, time, and  
money despite the  
conditions around you and  
the actions of others

# Defensive Driving

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- Making safe and legal driving decisions
- Creating a safe, stress-free environment around your vehicle
- Driving to your destination safely without a ticket, crash, or affecting others' safety
- Practicing common sense, courtesy, and cooperation
- Recognizing the risks of hazardous driving behaviors and conditions

## The Five Keys

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1. Aim high in steering.
2. Get the big picture.
3. Keep your eyes moving.
4. Leave yourself an out.
5. Make sure they see you.

# Distracted Driving

## What is distracted driving?

Any activity that could divert a person's attention away from the primary task of driving. The three types of distractions are manual (taking your hands off the wheel), visual (taking your eyes off the road), and cognitive (taking your mind off driving). All distractions endanger passenger, driver, and bystander safety.

- Distractions include:
  - Texting, using a cell phone or smart phone
  - Eating or drinking
  - Talking to passengers
  - Grooming
  - Reading, including maps
  - Using a navigation system
  - Watching a video
  - Adjusting music or audio, on the radio or another device

***Make sure you are aware of your company's policies regarding communication devices.***

Source: [US DOT National Highway Safety Administration Distraction Website](#)

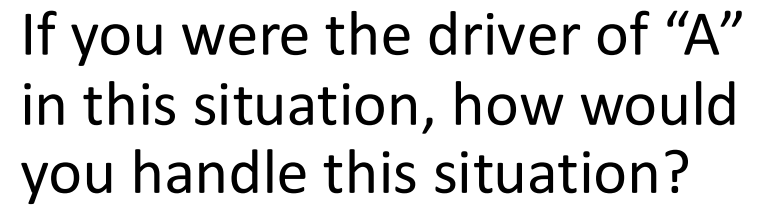
# Defensive Driving

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## Act in time

- Always stay alert, focus on the driving task so you don't lose response time.
- Choose the safest driving maneuver to avoid a crash.
- Remember: other drivers may act in time, but they may act incorrectly.





# Defensive Driving



- Avoid backing your vehicle
- 4-second following distance
- Don't rush
- Maintain a “cushion of safety”
- Be aware of your surroundings

# Distracted Driving

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- It is a MYTH that we can multi-task
- All brains focus in the same way
- We can shift our attention quickly, but we cannot pay attention to more than one thing at a time
- More than divided, our attention is diverted.



# Unit 2.4 Speed Management

*This unit satisfies FMCSA's ELDT requirements for units A1.2.4, BA1.2.4, and B1.2.4*

# Speed Management

Total braking distance is a combination of the following:

**Perception Distance:** How far your vehicle travels from the time your eyes see a hazard until your brain recognizes it.

**Reaction Distance:** The distance traveled from the time your brain recognizes the hazard and your foot pushes the brake pedal.

**Braking Distance:** The distance required to stop the vehicle once brakes are applied

Speeding reduces your ability to steer safely around curves or obstacles, extends the necessary stopping distance, and increases the distance your vehicle travels while you react to the situation.

Source: [\*National RTAP. Safety Training and Rural Transit Training Module\*](#)

# Speed Management

Note that braking distance increases with air brakes, due to the lag time for brakes to activate. Factors such as weather, visibility and road conditions can also increase braking distance.

## Calculating Reaction Distance

To calculate reaction distance, take the first digit of the speed of your vehicle plus the total speed.

Example: 25 mph + 2 + 27 feet reaction distance.

Add braking distance to calculate stopping distance from moment of reaction until the vehicle is stopped.

Source: [\*National RTAP. Safety Training and Rural Transit Training Module\*](#)

# Speed Management

- When traveling behind another vehicle, keep speed at a level that allows for safe stopping. While there are rules of thumb regarding following distance, what is safe will depend upon the driver, the vehicle, weather conditions, road conditions, traffic conditions, and speed of travel.

## How much space do you need?

- One second of space for each 10 feet of vehicle (below 40 mph)
- Add one second for speeds greater than 40mph

**Example:** (For a 30 ft bus in slower city traffic): 3 seconds between you and the vehicle in front of you

**Example:** (for a 30 ft bus on an interstate) 4 second minimum between you and the vehicle in front of you.

Source: [\*National RTAP. Safety Training and Rural Transit Training Module\*](#)

# Speed Management

## The 1,000 and 4 Rule

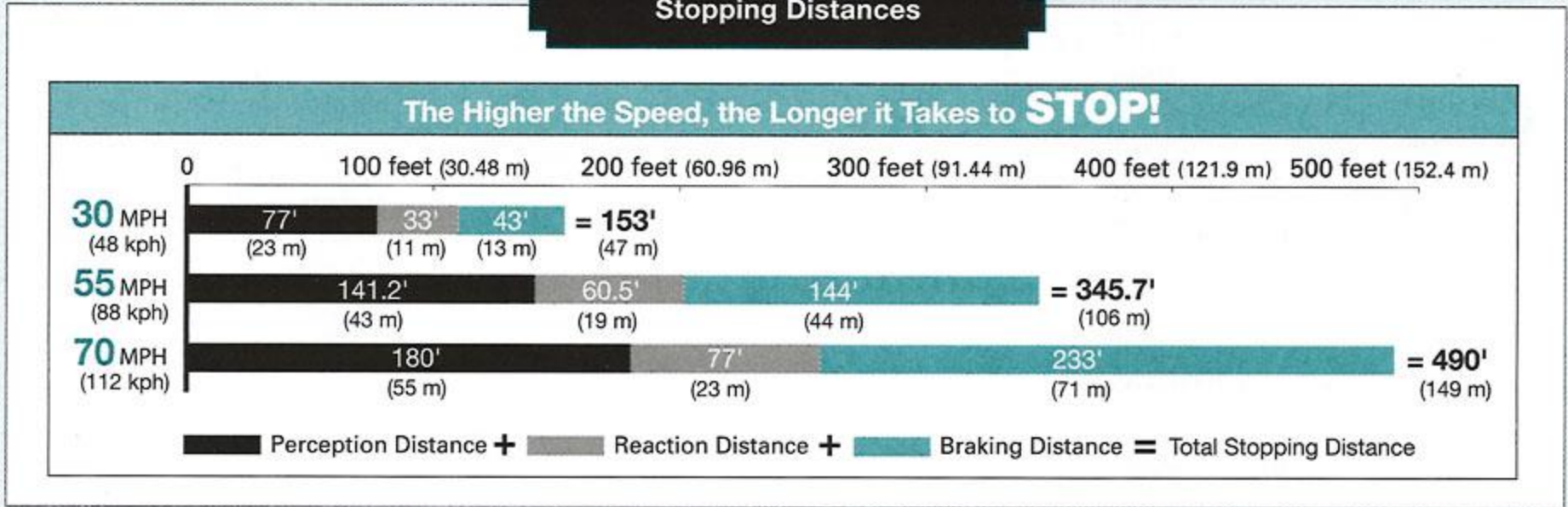
When the vehicle ahead passes a fixed point, like a sign, tree, or pole, begin counting “one thousand one, one thousand two, one thousand three, one thousand four.” If you pass the same point before reaching “one thousand four,” you are following too closely.

Source: [\*National RTAP. Safety Training and Rural Transit Training Module\*](#)



# Stopping Distances

The Higher the Speed, the Longer it Takes to **STOP!**



# Speeding

- Contributing factor in fatal crashes.
- #1 unsafe driving behavior that contributes to violations and crashes.
- Most common driving error:  
Exceeding the posted speed limit or driving at an unsafe speed
  - Costs nearly \$41 billion annually.



# Determining the Safest Driving Speed

- Know the speed limit.
- Assess the driving conditions.
  - The legal and posted speed limit may still be too fast.
  - Adjust your vehicle speed to the conditions that require a slower and safe speed.

# Determining the Safest Driving Speed

- For every 10mph over 50 mph, the risk of death in a traffic crash is doubled.
- You may be required to reduce your speed in many driving situations, including weather conditions
- Increasing speed decreases your field of vision and puts you at greater risk of being involved in a crash.

# Determining the Safest Driving Speed

- **Minnesota's basic speed law requires you to drive at a speed no faster than is reasonable under existing conditions.** These include weather, traffic, and road conditions.
- Driving faster than the posted speed limit is illegal.
  - The posted speed limit is the maximum speed permitted on that particular road.
  - The speed limit on two-lane highways with a posted speed limit of 55 mph or higher is increased by 10 mph when the driver is lawfully passing another vehicle in the same direction.
- Minimum speed limits may be posted on some roads.
  - It is illegal to drive slower than the posted minimum speed under normal weather, traffic, and road conditions.
- Note: If you approach an intersection at an unlawful speed, you lose the right-of-way privilege associated with driving at a lawful speed.

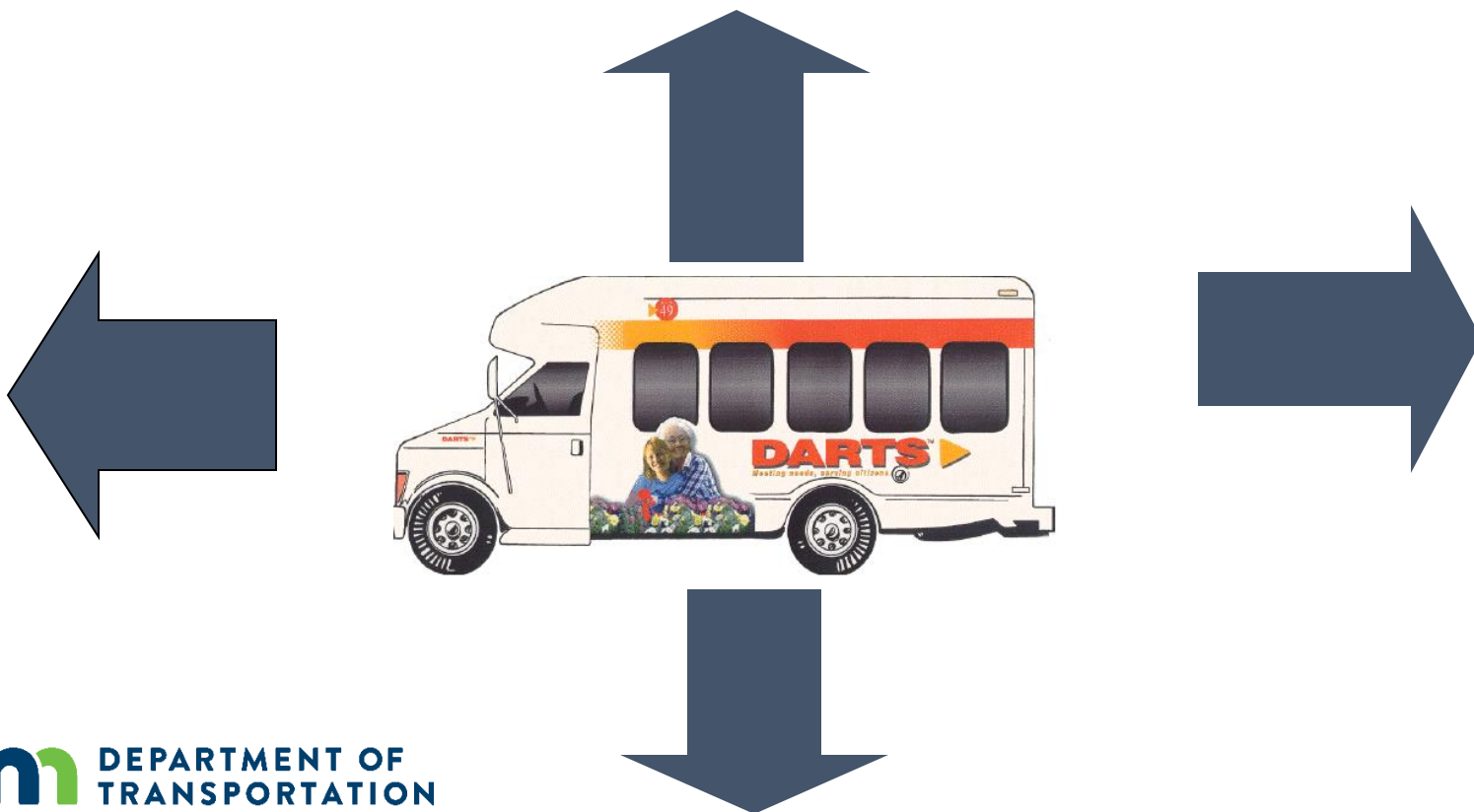


# Unit 2.5 Space Management

*This unit satisfies FMCSA's ELDT requirements for units A1.2.5, BA1.2.5, and B1.2.5*

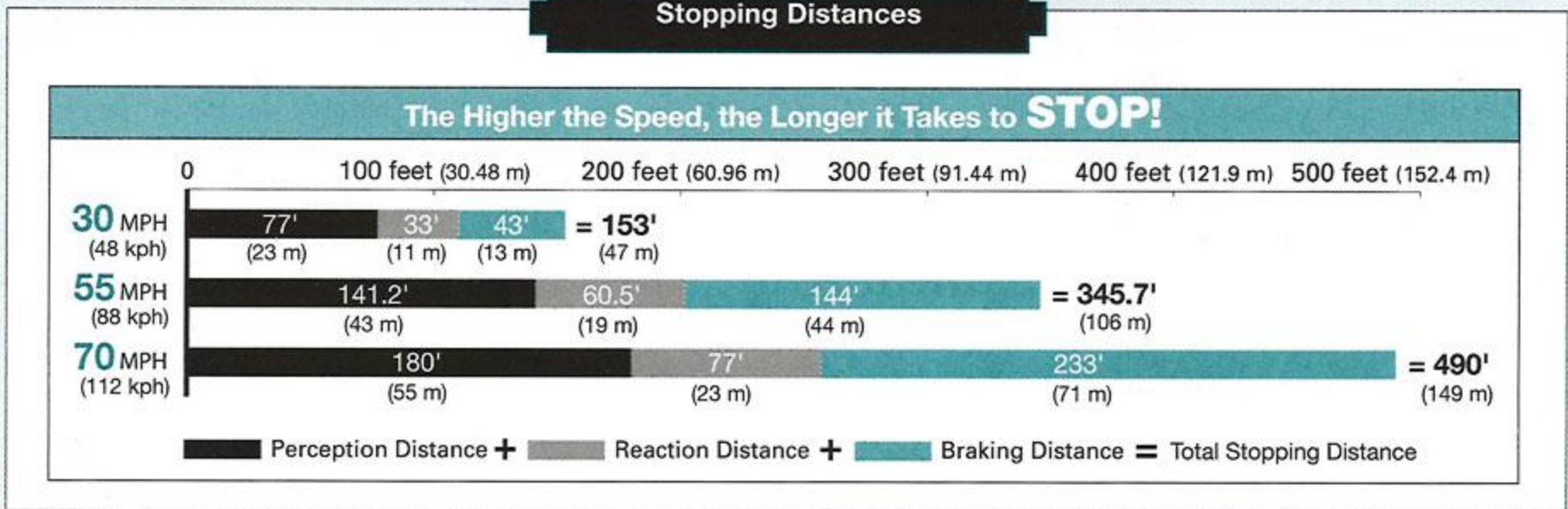
## #4 Leave Yourself an Out ®

Think “space” when pulling up to a car in front of you or selecting a parking/backing environment



# Stopping Distances

- The Higher the Speed, the Longer it Takes to **STOP!**



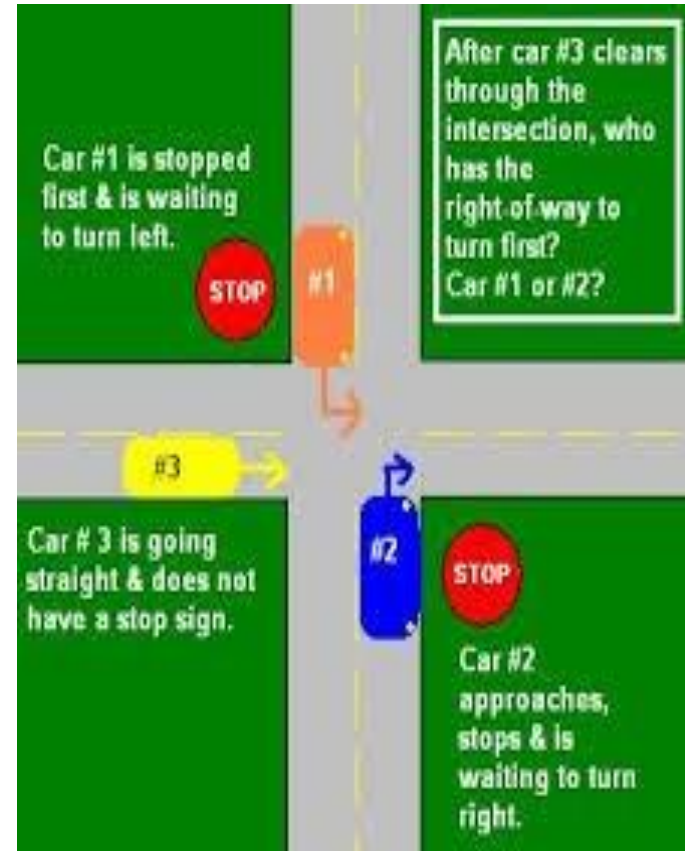
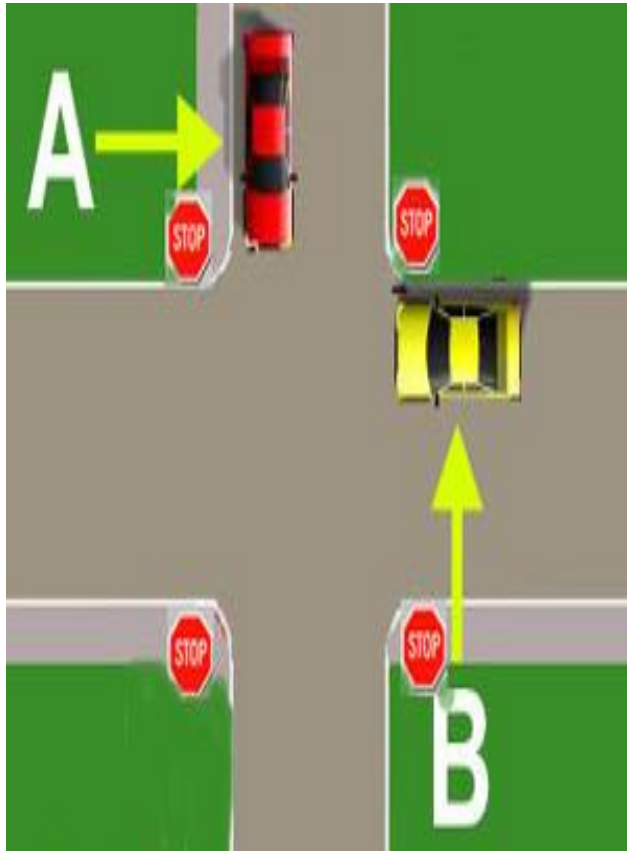


## Right of Way

**“Nobody ever yielded their way into a collision.”**

- It is not about who has the right of way.
- It is about who shall yield the right of way.

# Right of Way



# Right of Way & Yielding

**Right-of-way and yielding laws help traffic flow smoothly and safely. They are based on courtesy and common sense. Violation of these laws is a leading cause of traffic crashes.**

Two vehicles reach an intersection at the same time and...	The rule is...
No traffic light or signal to control the intersection	Driver on left yields to vehicle on right
All-way stop signs or flashing red lights control the intersection	Driver on left yields to vehicle on right

- Drivers in the right lane must yield to transit buses attempting to merge from a bus stop or shoulder.

# Right of Way

- A majority of urban crashes occur at intersections.
- Intersection crashes in rural areas, although less common are often more serious because speed limits are higher.
- Right-of-way violations are related to more injuries than any other improper driving behavior.

## Driving Left of Center

Only pass in the left lane when it is clearly visible and is free of oncoming **traffic** for the space needed to completely pass. The **center** of the road is the **center** of the road, whether or not it's marked



# Tailgating

- Final unsafe driving behavior that results in many crashes and violations.
- Biggest hazard is a rear-end collision.
- Ability to stop depends on vehicle weight, speed, road surface, driver and weather conditions.

# Distracted Driving

## **What to do with a tailgater? Stay Calm.**

- Continue driving the speed limit and obey traffic laws
- Be extra cautious if you need to brake
- Get safely out of the way – signal and change lanes if on a multi-lane road
- Drive at a comfortable, do not be pressured to drive outside of your comfort zone. That's simply swapping one unsafe situation for another.
- AVOID CONFRONTATION – Let them pass – don't give him dirty looks and make any rude hand gestures!

## Delayed Acceleration

### **You are the first vehicle at an intersection.**

- When the light turns green, wait two seconds before accelerating.
- Never enter an intersection you cannot exit.
- Wait for the intersection to clear before entering it.
- Be courteous despite other drivers being in a hurry.





# Unit 2.6 Night Operation

*This unit satisfies FMCSA's ELDT requirements for units A1.2.6, BA1.2.6, and B1.2.6*

# Night Operation

You are at greater risk when you drive at night due to poor lighting, glare, and other factors that increase hazard recognition time as well as driver reaction time.

**Poor lighting:** some areas may have bright streetlights, but many do not. On most rural roads you will probably have to depend entirely on your headlights. Less light means you will not be able to see hazards as clearly or as soon. Dirty headlights only produce a fraction of the light they should, so keep headlights clean.

**Glare:** You can be blinded for a short time by bright lights, and it takes time to recover. The risks are greater for drivers who visual recovery time is higher.

Source: [\*National RTAP. Safety Training and Rural Transit Training Module\*](#)

# Night Operation

**Visual Recovery Time:** This is the time it takes night vision to return after encountering a bright light. Causes of increased visual recovery time include age (this increases as you get older), high blood pressure and diabetes.

**Other Drivers:** There is an increased number of tired and intoxicated drivers on the road at night. Recognition and reaction time are both slowed by exhaustion and intoxication.

**Windshield and Mirrors:** Bright lights refract off dirt on windshields and mirrors creating glare, so it is particularly important at night to have clean windshields and mirrors.

Source: [\*National RTAP. Safety Training and Rural Transit Training Module\*](#)

# Night Operation

**Headlights:** You should turn lights on approximately one hour before it gets dark and leave them on until the sun has risen above the horizon and the lights can no longer be seen on the road surface.

*Consult with your agency find out what local laws or agency policies regarding headlight use apply.*

- At night, low beams allow you to see about 250 ft ahead of you. High beams extend your sight distance to 350-400 ft. If using high beams, dim within 1,000 feet of other vehicles. Defensive driving indicates that you adjust your speed to keep stopping distance within your sight distance. If a vehicle approaches with its high beam lights on, look towards the edge of the road on your right. Do not flash your bright lights at the drivers as it temporarily impairs their ability to see the road and your vehicle.

Source: [National RTAP. Safety Training and Rural Transit Training Module](#)

# Night Operation

## If your lights fail:

- Try high and low beams (one may work)
- Pull safely off the roadway and inform your passengers
- Set up the emergency warning equipment (triangles, flares)
- Call the dispatcher for further instructions

**Turn signals and brake lights:** at night your turn signals and brake lights are even more important for communicating with other drivers. Make sure you have clean, working turn signals, brake lights, taillights, clearance lights and reflectors.

# Night Operation

- Good vision is critical for safe driving
- Can't see hazards as quickly at night – increasing response time and chance of crashes
- Regular eye checkups are important: you can't fix what you don't know
- It's illegal not to wear corrective lenses if its on your license
- Avoid tinted lenses at night
- Look at the right side of the road/side lines when someone with bright lights on approaches to avoid being blinded. Two seconds of blindness can be dangerous at 55 mph.

# Night Operation

## **Fatigue negatively impacts vision and judgement**

- Fatigue is physical or mental tiredness that can be caused by physical or mental strain, repetitive tasks, illness or lack of sleep
- Drivers may experience short bursts of sleep lasting only a few seconds or fall asleep for longer periods of time
- Crashes tend to occur when sleepiness is more pronounced
- Most people are less alert at night
- If you are tired, the only safe cure is sleep

# Night Operation

## Night Driving Procedures Pre-trip\* Procedures

- Be rested and alert
- Clean and unscratched glasses, no sunglasses
- During pre-trip\*: Clean lights and reflectors you can reach
- Dim lights
  - Oncoming vehicle: within 1,000 feet
  - Following vehicle: 200 feet
- Do not flash your brights/high beams at those who have theirs on, it increases chance of crash by blinding oncoming driver
- Use high beams when safe and legal
- Bright cab makes it harder to see outside.
- Adjust interior lights & instrument lights

*\*The CDL Manual now refers to pre-trip inspection as vehicle inspection*



# Unit 2.7 Extreme Driving Conditions

*This unit satisfies FMCSA's ELDT requirements for units A1.2.7, BA1.2.7, and B1.2.7*

# Extreme Driving Conditions

**Fog can occur any time, be unexpected, and deteriorate visibility rapidly – avoid driving**

If you must drive through it consider:

- Obey fog-related warning signs
- Slow down before entering
- Use low-beams and fog lights, even in daytime
- Be alert for those who may have forgotten to turn on their lights
- Turn on 4-way flashers so vehicles behind you can notice your vehicle
- Watch for vehicles on side of the road
- Taillights and headlines may not be the true indication of where the road is
- Use roadside reflectors as guides to determine how the road curves
- Listen for traffic you can't see
- Avoid passing other vehicles
- Don't stop along the side of the road unless necessary

# Extreme Driving Conditions

## Adverse Conditions and Reduced Visibility

Dust, smoke, fog, rain, and snow can all reduce visibility while driving. If you find yourself in this situation, keep the following in mind:

1. Slow down
2. Turn on your lights
3. Use your low beams. High beams reflecting off snow, rain or dust tend to reduce visibility
4. Increase following distance to two or three times that of normal driving conditions
5. Avoid stopping in or alongside the roadway in dense fog, smoke, or snow; this could result in a serious rear-end collision from traffic behind you. If you must stop, turn off your lights, so you do not lead other cars off the road.

Source: [\*National RTAP. Safety Training and Rural Transit Training Module\*](#)

# Extreme Driving Conditions

## Driving Through Water

Avoid driving through water if at all possible. If you are unable to avoid driving through deep puddles or flowing water, you should:

1. Slow down
2. Place transmission in low gear
3. Increase engine RPM and cross the water
4. After you exit the water, maintain light pressure on the brakes for a short distance to heat them up and dry them out
5. Make a test stop when safe to do so — check behind to make sure no one is following and apply the brakes to be sure they work correctly.
6. NEVER drive your vehicle through swiftly running water or standing pools whose depth cannot be judged. A few inches of a strong current can undermine roadbeds as well as carry your vehicle off the roadway.

Source: [\*National RTAP. Safety Training and Rural Transit Training Module\*](#)

# Extreme Driving Conditions

## Winter Driving

- During the pre-trip\* inspection, pay particular attention to tire tread, vehicle heating system, and on-board emergency equipment.
- Increase following distance by two or three times normal
- Take curves at slower speeds; brake prior to curve
- Anticipate stops early and slow down gradually
- Ice tends to form on shaded and elevated areas sooner and remain longer than in areas that are exposed to the sun.

Source: [National RTAP. Safety Training and Rural Transit Training Module](#)

*\*The CDL Manual now refers to pre-trip inspection as vehicle inspection*

# Extreme Driving Conditions

## Winter Driving (continued)

- Pre-trip\*:
  - Extra attention to coolant and antifreeze levels
  - Make sure defrosters and heaters work
  - Windshield Wipers
    - Are in good condition and tight against the window
    - Washer works and fluid is full
    - If they fail while in service, stop safely and fix
  - Tires have enough tread – AT LEAST
    - 4/32" Front
    - 2/32" Other

*\*The CDL Manual now refers to pre-trip inspection as vehicle inspection*

# Extreme Driving Conditions

## Winter Driving (continued)

- Chains:
  - Carry the right number of chains and extra cross-links.
  - Fit your drive tires.
  - Check the chains for broken hooks, worn or broken cross-links, and bent or broken side chains.
  - Learn how to put the chains on before you need to do it in snow and ice.
  - **Note the use of tire chains are illegal in MN**

# Extreme Driving Conditions

## Summer Driving

- During the pre-trip\* inspection pay particular attention to tire condition, vehicle cooling/ventilation system, and on-board emergency equipment
- While driving, check engine temperature gauge and watch for coolant spills
- In extremely hot weather:
  - Inspect tires every two hours or 100 miles, whichever comes first. If tires are too hot to touch, remain stopped until tires cool down.
  - Watch for “bleeding tar” that has risen to the road surface as it can make the surface more slippery

Source: [National RTAP. Safety Training and Rural Transit Training Module](#)

*\*The CDL Manual now refers to pre-trip inspection as vehicle inspection*



# Extreme Driving Conditions

- Check Lights and Reflectors
  - Check to be sure they are clean and working properly before and during drive in bad weather
- Check Windows and Mirrors:
  - Remove ice and snow
  - Use scraper, snow brush and defroster as necessary
- Check Hand holds, Steps and Deck Plates:
  - Remove ice and snow to reduce danger of slipping
- Check Radiator Shutters and Winter front:
  - Remove ice from shutters
  - Ensure winter front is not closed too tightly to prevent engine from overheating

# Extreme Driving Conditions

- **Check Exhaust System**

- Leaks can promote poisonous CO2 in your vehicle
- Look and listen for leaks, loose parts

- **Slippery Surfaces: Proceed with caution**

- Drive slowly and smoothly on slippery roads
- Don't drive if very slippery
- Start gently and slowly
- Check for ice, especially on bridges and overpasses
- A lack of spray from other vehicles is an indicator of ice on the road
- Turn gently and don't brake in curve
- Don't use engine brake or speed retarder
- Adjust speed for conditions, avoid passing slower vehicles
- Note: As the temperature rises to melting ice, road becomes more slippery – slow down even more!

# Extreme Driving Conditions

## Steep Grades

- Look for grade signs posted. Don't guess at grades.
- It takes time to climb or descend grade. Don't rush.
- Don't make the mistake of letting the truck go at the bottom of the hill and thinking you're in the clear.
- There could be a patch of ice on the road or an unexpected curve. Pay attention and go slow until you reach the bottom.
- When you're ascending a grade, keep in mind it's possible to overheat a CMV even in winter months. Keep your eye on the temperature gauge.
- If the hill is slippery, do not follow in the tracks of the vehicle ahead of you.

# Extreme Driving Conditions

## Sharp Curves

- On curves – Many curves have reduced speed limits, though large trucks should often reduce their speed more than passenger cars before a curve. Hitting the brakes during a curve can result in the truck's wheels locking and it can throw the truck into a skid. Higher speeds on curves can also trip a rollover crash.
- On exit and entrance ramps – Trucks take longer to slow down than passenger cars, and the lower speed limit for on and off ramps is often too high for a semi-truck. These ramps can also have sharp curves that require a much lower speed.
- Just because a driver was technically complying with the speed limit does not mean that the driver was driving at a safe speed for the conditions of the road.



# Section 3 Advanced Operating Practices



# Unit 3.1 Hazard Perception

*This unit satisfies FMCSA's ELDT requirements for units A1.3.1, BA1.3.1, and B1.3.1*

# Hazard Perception

- A hazard is any road condition or other road user (driver, bicyclist, pedestrian) that is a possible danger. For example, a car in front of you is headed toward the freeway exit, but the car's brake lights come on and the driver begins braking hard. This could mean that the driver is uncertain about taking the offramp. He/she might suddenly return to the highway. This car is a hazard. If the driver of the car cuts in front of you, it is no longer just a hazard; it is an emergency.

# Hazard Perception

## Seeing Hazards Lets You Be Prepared

- You will have more time to act if you see hazards before they become emergencies. In the example above, you might make a lane change or slow down to prevent an accident if the car suddenly cuts in front of you. Seeing this hazard gives you time to check your mirrors and signal a lane change. Being prepared reduces the danger. A driver who did not see the hazard until the slow car pulled back on the highway in front of him/her would have to do something very suddenly. Sudden braking or a quick lane change is much more likely to lead to an accident.



## Hazard Perception

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There are often clues that will help you see hazards. The more you drive, the better you get at spotting hazards. Slow down and be very careful if you see any of the following road hazards:

# Hazard Perception

- **Work zones:** When people are working on the road it is a hazard. There may be narrower lanes, sharp turns or uneven surfaces. Other drivers are often distracted and drive unsafely. Workers and construction vehicles may get in the way. Drive slowly and carefully near work zones. Use your four-way flashers or brake lights to warn drivers behind you.
- **Drop-offs:** Sometimes the pavement drops off sharply near the edge of the road. Driving too close to the edge can tilt your vehicle toward the side of the road. This can cause the top of your vehicle to hit roadside objects (signs, tree limbs, etc.). It also can be hard to steer as you cross the drop-off, whether going off the road or coming back on.

# Hazard Perception

- **Foreign objects:** Things that have fallen on the road can be hazards. They can be a danger to your tires and wheel rims, damage electrical and brake lines, or become caught between dual tires and cause severe damage. Some obstacles that can appear to be harmless can be very dangerous. For example, cardboard boxes may be empty, but they also may contain solid or heavy material capable of causing damage. The same is true of paper and cloth sacks. Remain alert for objects of all sorts, so you avoid them without making sudden, unsafe moves.
- **Offramps/onramps:** Freeway and turnpike exits can be particularly dangerous for commercial vehicles. Offramps and onramps often have speed limit signs posted. Remember, these speeds may be safe for automobiles but may not be safe for larger vehicles or heavily loaded vehicles. Exits that go downhill and turn at the same time can be especially dangerous. The downgrade makes it difficult to reduce speed. Braking and turning at the same time can be a dangerous practice. Make sure you are going slow enough before you get on the curved part of an offramp or onramp.

# Hazard Perception

- **Perception Distance:** The distance your vehicle travels from the time you spot a hazard to the time you decide to take action.
- **Reaction Distance:** The distance your vehicle travels as you move your foot from the accelerator to the brake pedal and begin braking. Different situations can make reaction time slower: feeling sick, aging, etc.
- **Braking Distance:** The distance your vehicle travels after the brakes begin to take hold, until your vehicle comes to a complete stop.

# Hazard Perception

## Hazardous Drivers, Vehicles and Pedestrians

To protect yourself and others, you must know when other drivers may do something hazardous. Some clues to these types of hazards include:

- People who cannot see others - Be alert for drivers whose vision is blocked. Vans, loaded station wagons and cars with the rear window blocked are examples.
- Rental trucks - Drivers often are not used to the limited vision they have to the sides and rear of the truck.
- Vehicles with frosted, ice-covered or snow-covered windows.
- Partially hidden vehicles - Vehicles may be partly hidden by blind intersections or alleys. If you can see only the rear or front end of a vehicle but not the driver, then he/she cannot see you. Be alert because he/she may back out or enter into your lane. Always be prepared to stop

# Hazard Perception

- Delivery trucks - The driver's vision often is blocked by packages or vehicle doors. Drivers of step vans, postal vehicles and local delivery vehicles often are in a hurry and may suddenly step out of their vehicle or drive into the traffic lane.
- Parked vehicles - Parked vehicles can become hazards when passengers start to get out. Or they may suddenly start up and drive into your path. Watch for movement inside the vehicle or movement of the vehicle itself that shows people are inside. Watch for brake lights or backup lights, exhaust and other clues that a driver is about to move.
- Stopped buses - Passengers may cross in front of or behind the bus, and they often cannot see you.

# Hazard Perception

- Pedestrians and bicyclists - Walkers, joggers and bicyclists may be on the road with their backs to the traffic, so they cannot see you. They also may be wearing electronic devices so they cannot hear you either. On rainy days, pedestrians may not see you because of hats or umbrellas. They may be hurrying to get out of the rain and may not pay attention to the traffic.
- People who are distracted - Watch for where they are looking. If they are looking elsewhere, they cannot see you. But be alert even when they are looking at you; they may think they have the right-of-way.
- Children - Children tend to act quickly without checking traffic. Children playing with one another may not look for traffic and are a serious hazard.
- Talkers - Drivers or pedestrians talking to one another may not be paying close attention to the traffic.

# Hazard Perception

- Workers - People working on or near the roadway creates a distraction for other drivers, and the workers themselves may not see you.
- Ice cream trucks - Children may be nearby and may not see you.
- Disabled vehicles - Drivers changing a tire or fixing an engine often do not pay attention to the dangers of roadway traffic. They often are careless. Jacked-up wheels or raised hoods are hazard clues.
- Accidents - People involved in the accident may not look for traffic. Passing drivers tend to look at the accident. People often run across the road without looking. Vehicles may slow down or stop suddenly.
- Shoppers - People in and around shopping areas often are not watching traffic because they are looking for stores or looking into store windows.



# Hazard Perception

- Turning vehicles - Drivers signaling a turn may slow more than expected or stop. If they are making a tight turn into an alley or driveway, they may go very slow. If they are blocked by pedestrians or other vehicles, they may stop on the roadway. Vehicles turning left may stop for oncoming vehicles.
- Confused drivers - Confused drivers often change direction suddenly or stop without warning. Confusion is common near freeway interchanges and major intersections. Tourists unfamiliar with the area can be very hazardous. Clues to tourists include car-top luggage and out-of-state license plates. Unexpected actions (stopping in the middle of a block, changing lanes for no apparent reason, back-up lights suddenly going on) are clues to confusion. Hesitation is another clue, including driving very slowly, using brakes often or stopping in the middle of an intersection. You also may see drivers looking at street signs, maps and house numbers. These drivers may not be paying attention to you.

# Hazard Perception

- Slow drivers - Motorists who fail to maintain normal speed are hazards. Seeing slow-moving vehicles early can prevent a crash. Some vehicles, by their nature, are slow and seeing them is a hazard clue (mopeds, farm implements, construction machinery, tractors, etc.). Some will have the Slow-Moving Vehicle symbol to warn you. Watch for a red triangle with an orange center.
- Drivers in a hurry - Drivers may feel your commercial vehicle is preventing them from getting where they want to go on time. Such drivers may pass you without a safe gap in the oncoming traffic, cutting too close in front of you. Drivers entering the road may pull in front of you to avoid being stuck behind you, causing you to brake. Be aware of this and watch for drivers who are in a hurry.

# Hazard Perception

- Impaired drivers - Drivers who are sleepy, have had too much to drink, are on drugs, or are ill are hazards. Some clues to these drivers include:
  - Weaving across the road or drifting from one side to another.
  - Leaving the road (dropping right wheels onto the shoulder or bumping across a curb in a turn).
  - Stopping at the wrong time (stopping at a green light or waiting too long at a stop).
  - Open window in cold weather.
  - Speeding up or slowing down suddenly, driving too fast or too slow.
  - Be alert for drunk drivers and sleepy drivers late at night.

# Hazard Perception

Video: [Driving Through Road Construction](#). City of Bloomington—2:32 minutes



# Hazard Perception

- **Visual Search: Check your mirrors every 3 – 5 seconds.** Use the “Lean and Look” technique. Move in your seat to check your blind spots. Your vehicle has many obstacles to look around.
- You look for hazards in order to have time to plan a way out of any emergency. When you see a hazard, think about the emergencies that could develop and figure out what you would do. Always be prepared to take action based on your plans. This way, you will be a prepared, defensive driver who will improve not only your own safety but the safety of everyone on the road.

# Unit 3.2 Skid Control/Recovery, Jackknifing, and Other Emergencies

*This unit satisfies FMCSA's ELDT requirements for units A1.3.2, BA1.3.2, and B1.3.2*

# Skid Control/Recovery, Jackknifing, & Other Emergencies

## 5 Ways to control an unintentional skid:

1. Slow down
2. Accelerate slowly
3. Brake slowly by pumping the brakes
4. Don't jerk or suddenly turn the steering wheel
5. Look ahead and anticipate

## If your vehicle starts to skid:

1. Ease up on the accelerator
2. Do not brake
3. Turn the steering wheel in the direction you want to go (sometimes called "turning into the skid")

Source: [\*National RTAP. Safety Training and Rural Transit Training Module\*](#)

## Skid Control/Recovery, Jackknifing, & Other Emergencies

- A power skid occurs as a result of too much acceleration, causing the drive wheels to lose traction and spin free of the road. This usually results in fishtailing, with the rear of the vehicle sliding to one side or the other.
- Braking skids occur when wheels lock up and slide along the surface of the road (often when wet or slippery). The vehicle will continue in the same direction and will not respond to steering until rolling friction is re-established. These can be unpredictable and hard to control because all four wheels are involved.

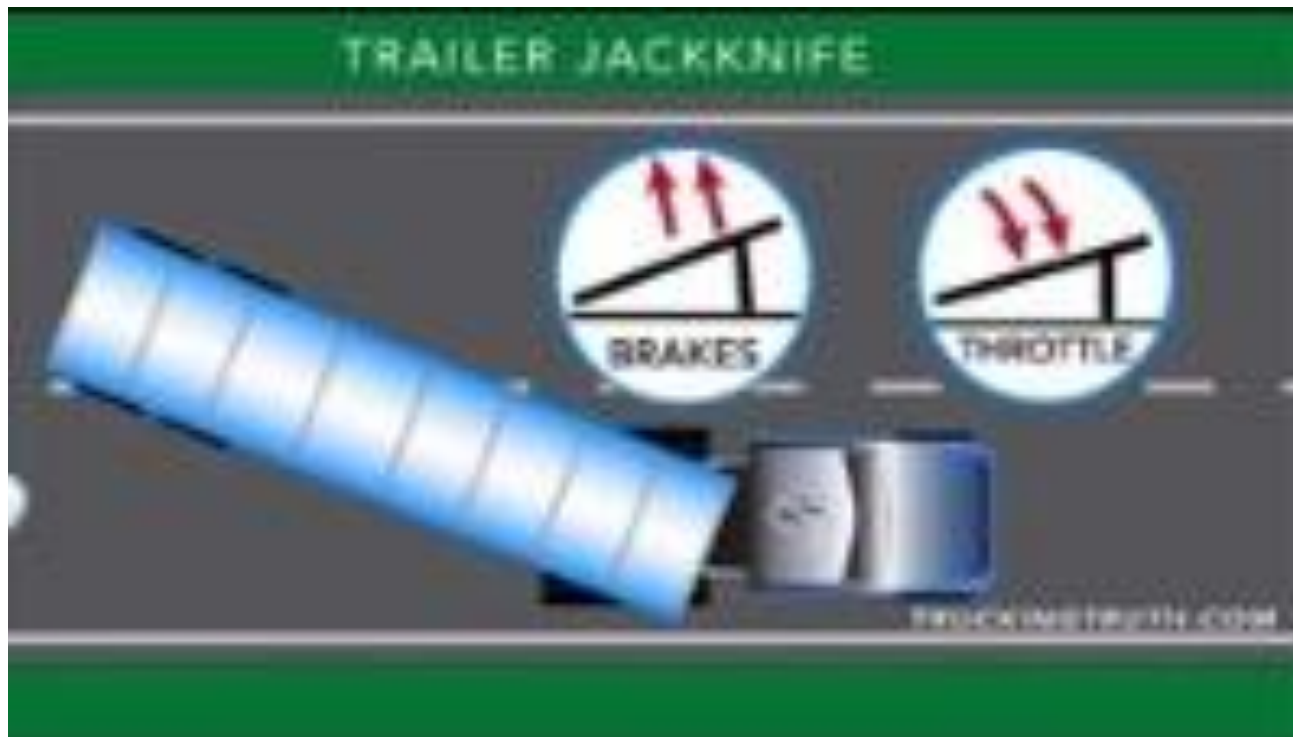
Source: [\*National RTAP. Safety Training and Rural Transit Training Module\*](#)



# Skid Control/Recovery, Jackknifing, & Other Emergencies

## Tips for getting out of a trailer jackknife:

Video: [Tips for getting out of a trailer jackknife](#). Trucking Truth—0:31 minutes



## Skid Control/Recovery, Jackknifing, & Other Emergencies

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If your vehicle has good directional control, you will be able to keep the vehicle moving in the direction in which you steer it. This is important in preventing crashes.

## Skid Control/Recovery, Jackknifing, & Other Emergencies

**Stopping on a slippery surface:** A wet road can double the stopping distance. A safe driver will reduce their speed about 1/3, from 55 to 35 on a wet road. Packed snow calls for a reduction in speed of or more and if the surface is icy a driver must reduce speed to a crawl.

**Water left on the road can lead to hydroplaning.** It is like water skiing. The tires lose their contact with the road and have little or no traction. An alert driver can regain control of the truck by releasing the accelerator and pushing in on the clutch. This will slow the vehicle and let the wheel turn freely. It is impossible to stop the vehicle by simply using the brake. It does not take a lot of water to hydroplane and it can happen with speeds as low as 30 MPH

## Skid Control/Recovery, Jackknifing, & Other Emergencies

### **Evasive Steering helps you avoid a crash.**

- Stopping is not always the safest thing to do in an emergency. When you do not have enough room to stop, you may have to steer away from what is ahead. Remember, you can almost always turn to miss an obstacle more quickly than you can stop (however, top-heavy vehicles and tractors with multiple trailers may overturn).
- Steering quickly: To turn quickly, you must have a firm grip on the steering wheel with both hands. A quick turn can be made safely if it is done correctly

## Skid Control/Recovery, Jackknifing, & Other Emergencies

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# Skid Control/Recovery, Jackknifing, & Other Emergencies

## Steering quickly

To turn quickly, you must have a firm grip on the steering wheel with both hands. A quick turn can be made safely if it is done correctly

- Do not apply the brakes while you are turning. It is very easy to lock your wheels while turning. If that happens, you may skid out of control.
- Do not turn any more than needed to clear whatever is in your way. The more sharply you turn, the greater the chances of a skid or rollover.
- Be prepared to “countersteer,” that is, to turn the wheel back in the other direction once you have passed whatever was in your path. Unless you are prepared to countersteer, you will not be able to do it quickly enough. Think of emergency steering and countersteering as two parts of one driving action.

# Skid Control/Recovery, Jackknifing, & Other Emergencies

## Where to steer

- If an oncoming driver has drifted into your lane, a move to your right is best. If that driver realizes what has happened, the natural response will be to return to his/her own lane. If something is blocking your path, the best direction to steer will depend on the situation.
- If you have been using your mirrors, you will know which lane is empty and can be safely used.
- If the shoulder is clear, going right may be best. No one is likely to be driving on the shoulder, but someone may be passing you on the left. You will know if you have been using your mirrors.
- If you are blocked on both sides, a move to the right may be best. At least you will not force anyone into an opposing traffic lane and a possible head-on collision.

# Skid Control/Recovery, Jackknifing, & Other Emergencies

## Off road recovery

In some emergencies, you may have to drive off the road. It may be less risky than facing a collision with another vehicle. Most shoulders are strong enough to support the weight of a large vehicle and, therefore, offer an available escape route. Following are guidelines if you must leave the road:

- Avoid braking - If possible, avoid using the brakes until your speed has dropped to about 20 mph. Then brake very gently to avoid skidding on a loose surface.
- Keep one set of wheels on pavement if possible - This helps to maintain control of the vehicle.
- Stay on the shoulder - If the shoulder is clear, stay on it until your vehicle has come to a complete stop. Signal and check your mirrors before pulling back onto the road.



# Skid Control/Recovery, Jackknifing, & Other Emergencies

## Returning to the Road

If you are forced to return to the road before you can stop, use the following procedures:

- Hold the wheel tightly and turn sharply enough to get right back on the road safely. Do not 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, countersteer immediately. The two turns should be made as a single “steer-countersteer” move.

## Skid Control/Recovery, Jackknifing, & Other Emergencies

### **How to respond to brake failure due to loss of hydraulic pressure:**

When the system will not build up pressure, the brake pedal will feel spongy or go to the floor. Actions you can try:

- **Downshift** – A lower gear will help to slow the vehicle.
- **Pump the brakes** – This may generate enough hydraulic pressure to stop the vehicle.
- **Use the parking brake** – The parking or emergency brake is separate from the hydraulic brake system. Therefore, it can be used to slow the vehicle. However, be sure to press the release button or pull the release lever at the same time you use the emergency brake so you can adjust the brake pressure and keep the wheels from locking up.

## Skid Control/Recovery, Jackknifing, & Other Emergencies

### Find an Escape Route

- While slowing the vehicle, look for an escape route — an open field, side street or escape ramp.
- Turning uphill is a good way to slow and stop the vehicle. Make sure the vehicle does not start rolling backward after you stop. Put it in low gear, apply the parking brake and, if necessary, roll back into some obstacle that will stop the vehicle.

## Skid Control/Recovery, Jackknifing, & Other Emergencies

### **How to respond to brake failure on downgrades**

- Going slow enough and braking properly will almost always prevent brake failure on long downgrades. Once the brakes have failed, look outside your vehicle for something to stop it.
- Use an escape ramp. If there is one, there will be signs posted. Ramps are usually located a few miles from the top of the downgrade. Some escape ramps use soft gravel that resists the motion of the vehicle and brings it to a stop. Others turn uphill, using the hill to stop the vehicle and soft gravel to hold it in place.
- If no escape ramp is available, take the least hazardous escape route you can, such as an open field or a side road that flattens out or turns uphill. Make the move as soon as you know your brakes do not work. The longer you wait, the faster the vehicle will go and the harder it will be to stop.

# Skid Control/Recovery, Jackknifing, & Other Emergencies

## How to respond to tire failures

Quickly knowing you have a tire failure will let you have more time to react. Having just a few seconds to remember what it is you are supposed to do can help you.

The major signs of tire failure are:

- **Sound** - The loud “bang” of a blowout is an easily recognized sign. Because it can take a few seconds for your vehicle to react, you might think it was another vehicle. But any time you hear a tire blow, you are safest to assume it is yours.
- **Vibration** - If the vehicle thumps or vibrates heavily, it may be a sign that one of the tires has gone flat. With a rear tire, that may be the only sign you get.
- **Feel** - If the steering feels “heavy,” it is probably a sign that one of the front tires has failed. Sometimes, failure of a rear tire will cause the vehicle to slide back and forth or “fishtail.” However, dual rear tires usually prevent this.

## Skid Control/Recovery, Jackknifing, & Other Emergencies

### **Faced with possible tire failure, you should do the following:**

- Hold the steering wheel firmly. If a front tire fails, it can twist the steering wheel out of your hand. The only way to prevent this is to keep a firm grip on the steering wheel with both hands at all times.
- Stay off the brake. It is natural to want to brake in an emergency. However, braking when a tire has failed could cause loss of control. Unless you are about to run into something, stay off the brake until the vehicle has slowed down. Then brake very gently, pull off the road and stop.
- Check the tires. After you have come to a stop, get out and check all the tires. Do this even if the vehicle seems to be handling all right. If one of your dual tires goes, the only way you may know it is by getting out and looking at the tires.

## Skid Control/Recovery, Jackknifing, & Other Emergencies

- A rollover crash takes place when the wheels of a vehicle lose contact with a road, causing the vehicle to tip over. While any vehicle can roll, those with narrow wheelbases and high centers of gravity, such as tall SUVs, buses, and commercial trucks, tip over more often than others.
- Rollover Causes — excessive speed on curves, cargo issues and other driver errors. Examples of driver errors:
  - Overcorrecting or oversteering
  - Driving too fast in windy or slippery conditions
  - Having to stop short and slam on the brakes
  - Making sudden movements
- **Like any accident, follow your agency's accident reporting procedures.**

## Skid Control/Recovery, Jackknifing, & Other Emergencies

### **Examples of actions that create and worsen unsafe situations:**

- Knowingly using defective equipment or not properly maintaining a vehicle increases chance equipment failure and accidents
- Speeding (including driving too fast for conditions) reduces time to react
- Inattentive or distracted driving reduces opportunity to spot potential hazards and respond to them
- Illegal passing can limit visibility for both the CMV driving and others
- Following too closely decreases the time and space the CMV driver has to void a collision if the vehicle in front of a truck makes an erratic turn, slows suddenly, or stops quickly, even at speeds below 65 miles per hour.
- Failing to yield can lead to dangerous head-on collisions and T-bone collisions.
- “Camping” in the left lane forces vehicles to pass on the right, where the CMV driver has massive blind spots.



# Unit 3.3 Railroad (RR)- Highway Grade Crossings and Drawbridges

## Railroad (RR)-Highway Grade Crossings & Drawbridges

### Drawbridges

- Stop at drawbridges that do not have a signal light or traffic control attendant
- Stop at least 50 feet before the draw of the bridge. Look to make sure the draw is completely closed before crossing. You do not need to stop, but must slow down and make sure it's safe, when:
  - There is a traffic light showing green.
  - The bridge has an attendant or traffic officer who controls traffic whenever the bridge opens.

# Railroad (RR)-Highway Grade Crossings & Drawbridges

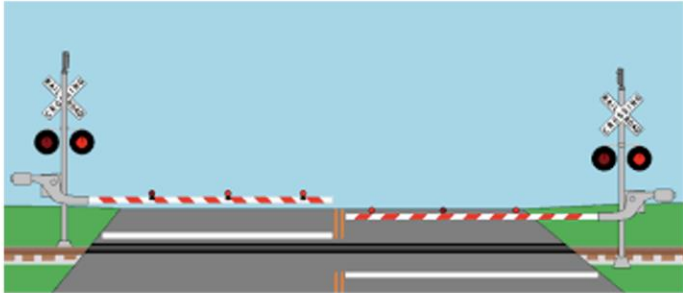
## Railroad Grade Crossing Environments Overview

- Highway-railroad grade crossings are intersections where a highway crosses a railroad at-grade. They are also called level crossings in Canada & other countries.
- To avoid collisions, warning/control devices are required at grade crossings
- Active Grade Crossings have:
  - Active warning and control devices such as bells, flashing lights, & gates
  - Passive warning devices such as crossbucks (x-shaped signs that mean yield to the train), yield, or stop signs and pavement markings.
- Passive Grade Crossings have only passive warning devices. These warning/control devices are specified in the [Manual of Uniform Traffic Control Devices](#) (MUTCD).

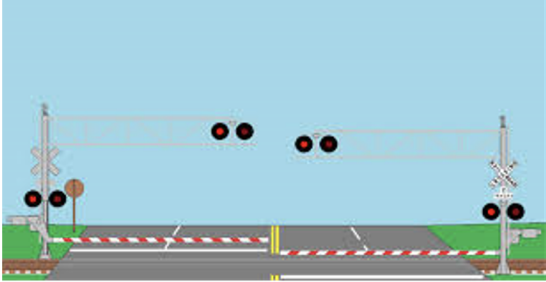
## Railroad (RR)-Highway Grade Crossings & Drawbridges

- Grade crossings may be public or private:
  - Public grade crossings are roadways that are under the jurisdiction of, and maintained by, a public authority.
  - Private grade crossings are on privately owned roadways, such as on a farm or industrial area, and are intended for use by the owner or by the owner's licensees & invitees. A private crossing is not intended for public use and is not maintained by a public highway authority.

# Railroad (RR)-Highway Grade Crossings & Drawbridges

Actions	Do this
<p><b>1.</b> When approaching railroad crossings on two lane roads</p> 	<ul style="list-style-type: none"> <li><b>a.</b> Activate four-way signals 150 feet before reaching the tracks.</li> <li><b>b.</b> Come to a complete stop no closer than 15 feet and no further than 50 feet away from the tracks. The vehicle must stop behind the white line (if a line is present) or behind the crossing arm.</li> <li><b>c.</b> Look in both directions while listening for an approaching train.</li> <li><b>d.</b> Check safety zones and mirrors before proceeding.</li> <li><b>e.</b> Proceed slowly over the tracks to avoid damage to the vehicle.</li> <li><b>f.</b> Turn off four-way signals after the vehicle has completely crossed the tracks.</li> </ul>

# Railroad (RR)-Highway Grade Crossings & Drawbridges

Actions	Do this
<div data-bbox="382 425 425 439" data-label="Text">Font</div> <p data-bbox="434 458 937 515">1. When approaching railroad crossings on a four-lane road</p> 	<ul style="list-style-type: none"> <li data-bbox="1020 458 1541 551">a. Activate right turn signal and proceed into the far-right driving lane (some exceptions apply).</li> <li data-bbox="1020 591 1508 648">b. Activate four-way signals 150 feet before reaching the tracks.</li> <li data-bbox="1020 688 1541 852">c. Come to a complete stop no closer than 15 feet and no further than 50 feet away from the tracks. The vehicle must stop behind the white line (if a line is present) or behind the crossing arm.</li> <li data-bbox="1020 892 1518 949">d. Look in both directions while listening for an approaching train.</li> <li data-bbox="1020 989 1479 1046">e. Check safety zones and mirrors before proceeding.</li> <li data-bbox="1020 1086 1489 1143">f. Proceed slowly over the tracks to avoid damage to the vehicle.</li> <li data-bbox="1020 1183 1518 1240">g. Turn off four-way signals after the vehicle has completely crossed the tracks.</li> </ul>

## Railroad (RR)-Highway Grade Crossings & Drawbridges

### **These vehicles are required to stop at all railroad grade crossings:**

- Buses carrying passengers
- School buses (whether carrying passengers or not)
- Placarded vehicles

### **Railroad Grade Crossing Violation**

- You will be disqualified from operating a commercial motor vehicle for:
- 60 days if you are convicted of a railroad grade crossing violation.
- 120 days if, during any three-year period, you are convicted of two railroad grade crossing violations arising from separate incidents.
- One year if, during any three-year period, you are convicted of three or more railroad grade crossing violations arising from separate incidents.

## Railroad (RR)-Highway Grade Crossings & Drawbridges

- 11 times more likely to be fatal
- Do not shift gears while crossing tracks
- Don't rely on RR crossing warning lights or gates
- Watch for vehicles that are required to stop at crossings
- Never race a train to the crossing
- Look for a second train
  - Eliminate all distractions & noises to listen for trains

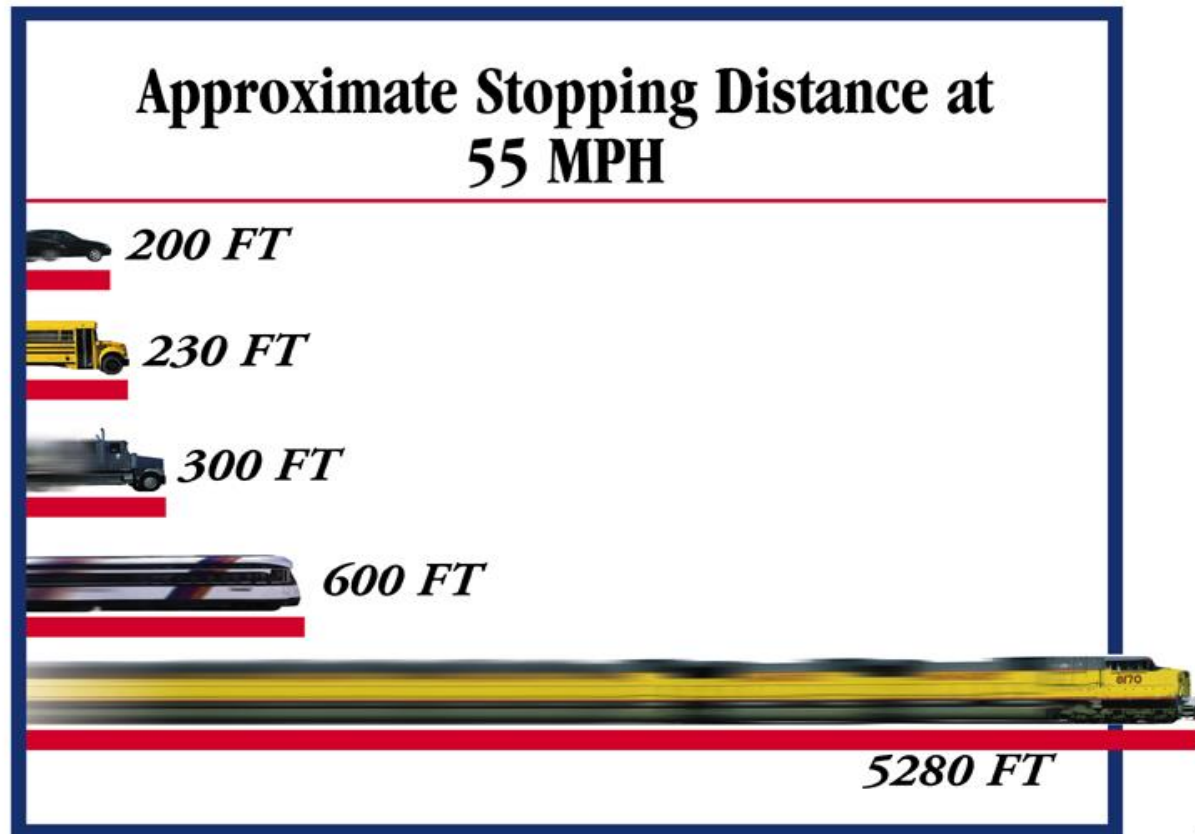


## Railroad (RR)-Highway Grade Crossings & Drawbridges

### Stalling on Railroad Tracks

- Once you begin crossing the tracks, do not hesitate. Cross without stopping.
- If your vehicle becomes stalled on railroad tracks and a train is approaching, leave the vehicle.
- To avoid being struck by debris from the collision keep a safe distance from the tracks.
- Walk quickly in a 45-degree angle away from the tracks in the direction from which the train is approaching.

## Railroad (RR)-Highway Grade Crossings & Drawbridges



## Railroad (RR)-Highway Grade Crossings & Drawbridges

### Trains Can't Swerve



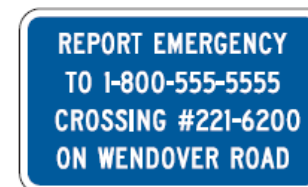
# Railroad (RR)-Highway Grade Crossings & Drawbridges

## Emergency Notification System (ENS) for Highway-Rail Grade Crossings

- Every highway-rail crossing has an Emergency Notification System (ENS) sign that provides a 24/7/365 phone number to call to report problems or emergencies at the railroad location.
- The blue colored ENS sign is located on the railroad crossing posts or the metal control box near the tracks. The ENS is for those emergencies that would require stopping train traffic due to an obstruction, disabled vehicle, or any other problem at the crossing.
- By providing the DOT number on the sign, the dispatchers know exactly where the grade crossing is and can notify trains moving in that direction to either come to a stop or be placed on a speed restriction.



I-13



I-13a

# Railroad (RR)-Highway Grade Crossings & Drawbridges

## Grade Crossing Signs

- As a minimum, one Crossbuck sign shall be used on the right side of each highway approach to every highway-rail grade crossing, alone or in combination with other traffic control devices.
- If automatic gates are not present & if there are two or more tracks at the highway-rail grade crossing, the number of tracks shall be indicated on a supplemental Number of Tracks (R15-2) sign of inverted T shape mounted below the Crossbuck sign



R15-1  
(drilled for 90-degree mounting)



R15-2

# Railroad (RR)-Highway Grade Crossings & Drawbridges

## Advance Warning Signs

- If the distance between the railroad tracks and the parallel highway, from the edge of the tracks to the edge of the parallel roadway, is 100 ft or more, a W10-1 sign will exist in advance of the highway rail grade crossing
- If the distance between the railroad tracks & a parallel highway, from the edge of the tracks to the edge of the parallel roadway, is less than 100 ft, W10-2, W10-3, or W10-4 signs exist on each approach of the parallel highway to warn road users making a turn that they will encounter a highway-rail grade crossing soon after making a turn



W10-1



W10-2



W10-3



W10-4

# Railroad (RR)-Highway Grade Crossings & Drawbridges

## Other Rail Grade Signs Examples

- If the highway profile conditions are sufficiently abrupt to create a hang-up situation for long wheelbase vehicles or for trailers with low ground clearance, the Low Ground Clearance Highway-Rail Grade Crossing Sign (W10-5) is present
- Turn prohibition signs (R3-2a) that are associated with preemption shall be visible only when the highway-rail grade crossing restriction is in effect.



W10-5



R3-2a  
Activated Blank-Out



R8-8



R8-9



W10-12



W10-15



W10-13

# Railroad (RR)-Highway Grade Crossings & Drawbridges

## Clearance around tracks

- Minnesota Administrative Rules, Transportation Department Chapter 8830, Part 8830.9951 – Required clearance:
  - 8 feet, 6 inches from the center of the track
  - Vertical clearance of 22 feet
- Per MnDOT's Railroad-Highway Grade Crossing Safety Improvement Program, crossings that have a sight distance obstruction or an alignment, which creates unsafe conditions at that grade crossing, may be identified for possible closure.
- Per Chapter 2 of the Federal Highway Administration's Highway-Rail Crossing Handbook, crossings with sight distance deficiencies which cannot be corrected should consider use of active devices at the stop.
- Stop your vehicle within 50 feet, but no less than 15 feet from the nearest rail. Listen and look in both directions along the track.



# Section 4 Vehicle Systems and Reporting Malfunctions

# Unit 4.1 Identification and Diagnosis of Malfunctions

# Identification & Diagnosis of Malfunctions

## Major vehicle systems

- Electrical System
  - Charging Circuit
  - Cranking Circuit
  - Ignition Circuit
  - Lighting & Accessory Circuits
- Drive Train
  - Clutch
  - Transmission
  - Drive Shaft & Universal Joints
  - Differential
- Frame
- Suspension System
- Axles
  - Engine
  - Diesel vs. Gas
- Fuel System
- Air Intake & Exhaust System
- Lubrication System
  - Maintaining the Lubrication System
  - Oil Filter System
- Cooling System

# Identification & Diagnosis of Malfunctions

- Steering System
  - Wheel Alignment
  - Power Steering
- Coupling System
  - Fifth Wheel
  - Kingpin

## Brake System

- Air Brakes
- Air Brake System Operation
- Antilock Brake Systems
- Checking for Defects
- Wheels & Tires
  - Wheels
  - Tires
  - Tread Design
  - Proper Tire Inflation & Care

# Identification & Diagnosis of Malfunctions

## Key Components and How to Inspect Them on a Class A Vehicle

Video: [Class A CDL Pre-Trip Engine Compartment Inspection & Training](#). *Wilson Logistics*—12 minutes



# Identification & Diagnosis of Malfunctions

## Key Components and How to Inspect Them on a Class B Vehicle

Video: [CDL Transit Bus Engine Pre-Trip Inspection](#). GMT Training— 3 minutes



# Identification & Diagnosis of Malfunctions

## Key Components and How to Inspect Them on a Truck Bus

Video: [Truck Bus Pre-Trip Inspection](#). GMT Training—35 minutes



# Identification & Diagnosis of Malfunctions

## Overview of the Function of an Engine and Its Importance to Safe Operation of Your Vehicle

Video: [CDL Instructional Video—Engine Components](#). Texas Department of Public Safety—5 minutes





# Identification & Diagnosis of Malfunctions

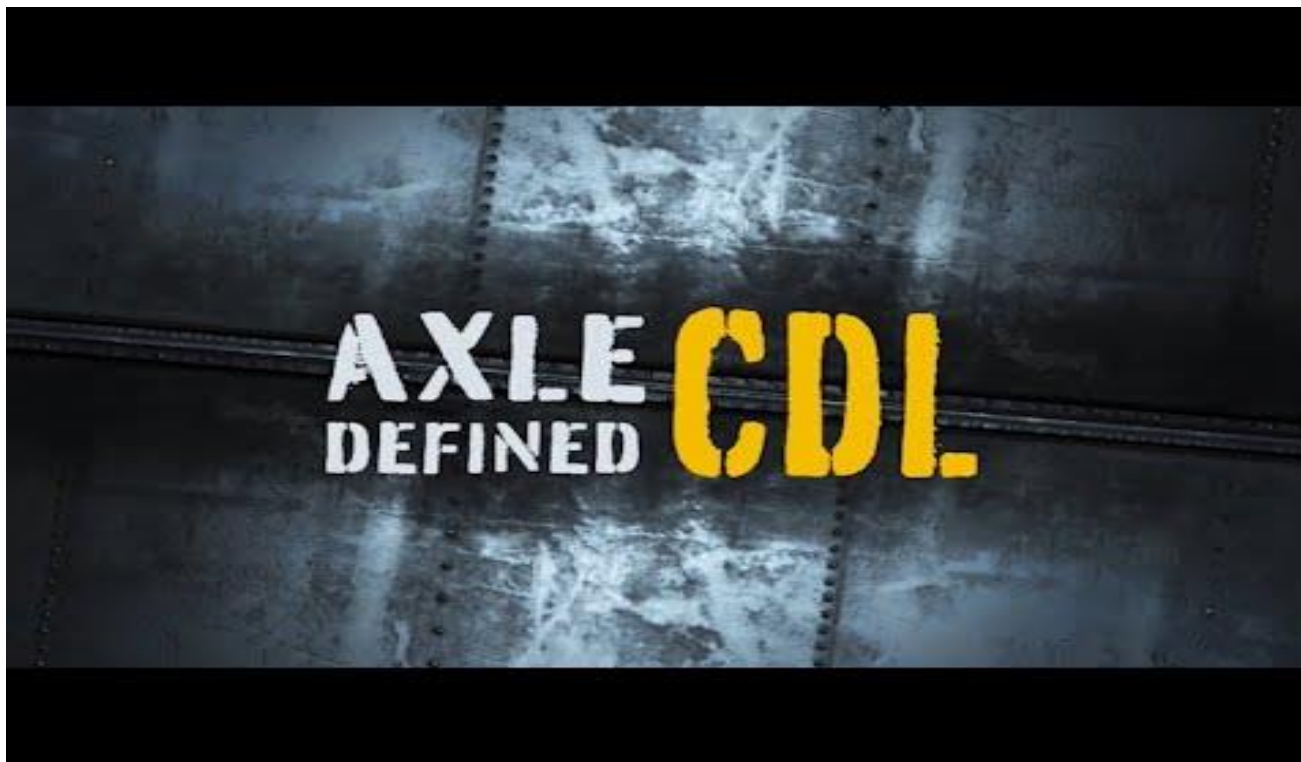
## Check the Engine Compartment

- Oil level
- Coolant level in radiator; condition of hoses
- Power steering fluid level; hose condition
- Windshield washer fluid level
- Battery fluid level, connections and tie-downs (battery may be located elsewhere)
- Automatic transmission fluid level (may require engine to be running)
- Check belts for tightness and excessive wear (alternator, water pump, air compressor)—learn how much “give” the belts should have when adjusted right, and check each one
- Leaks in the engine compartment (fuel, coolant, oil, power steering fluid, hydraulic fluid, battery fluid)
- Cracked, worn electrical wiring insulation.

# Identification & Diagnosis of Malfunctions

## Tires and Axles

Video: [CDL Instructional Video—The Axles](#). Texas Department of Public Safety— 5 minutes



# Identification & Diagnosis of Malfunctions

## Overview of the Function of Coupling Systems and Their Importance to Safe Operation of Your Vehicle

Video: [CDL Instructional Video — Coupling Systems](#). Texas Department of Public Safety—8 minutes



# Identification & Diagnosis of Malfunctions

## Overview of the Function of the Exterior of your Vehicle and its Importance to Safe Operation of Your Vehicle

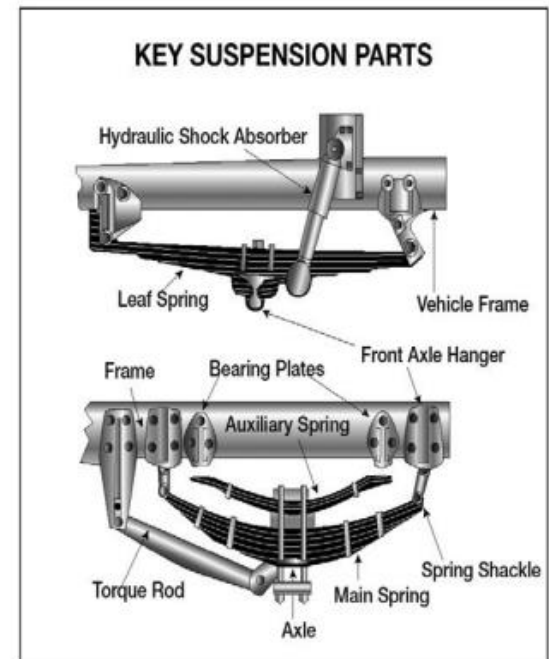
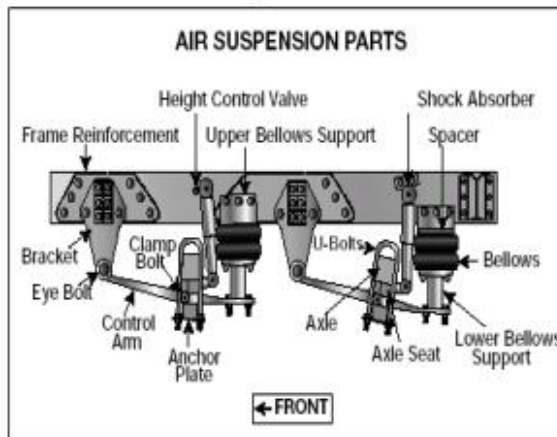
Video: [CDL Instructional Video — The Exterior](#). Texas Department of Public Safety—5 minutes



# Identification & Diagnosis of Malfunctions

## Suspension

- Suspension is the system of tires, tire air, springs, shock absorbers and linkages that connects a vehicle to its wheels and allows relative motion between the two.
- Check that your vehicle isn't leaning in one direction, this could indicate an issue with the suspension.



# Unit 4.2 Roadside Inspections

*This unit satisfies FMCSA's ELDT requirements for units A1.4.2, BA1.4.2, B1.4.2, and C1.17.*

# Roadside Inspections

## **What to expect during a roadside inspection:**

- Vehicles and drivers are examined to ensure compliance with state statutes and federal regulations pertaining to vehicle equipment, load securement, driver qualifications, hours of service, and a host of other requirements.
- There are 8 levels of inspection that could be performed.

## **Here's what to expect during a standard inspection:**

- CDL
- Alcohol and Drug use
- Medical Examiner's and Skill Performance Evaluation (SPE)
- Certificates
- Hours of Service Compliance

# Roadside Inspections

## **What to expect during a standard inspection (continued)**

- Record of duty status
- Seatbelt usage
- Vehicle inspection reports
- Brake, electrical, exhaust, and fuel systems
- Cargo securement
- Coupling devices
- Driveline/driveshaft mechanisms
- Frames
- Hazardous materials compliance



# Roadside Inspections

## **What to expect during a standard inspection (continued)**

- Lighting devices (headlamps, taillamps, turn signals, etc.)
- Steering mechanisms
- Suspensions
- Tires (including hubs, rims, wheels)
- Van and open-top trailer bodies
- Windshield wipers

# Roadside Inspections

## What is Out-of-Service (OOS)?

A driver is not permitted to drive after being on duty in excess of the maximum periods permitted, as detailed in [49 CFR 395.13](#). Motor carriers cannot require or permit a driver who has been declared out-of-service to operate a CMV until the driver may lawfully do so.

Out-of-Service (OOS) order means a declaration by an authorized enforcement officer of a Federal, [State](#), Canadian, Mexican, or local jurisdiction that a [driver](#), a [commercial motor vehicle](#), or a [motor carrier](#) operation is out of service pursuant to [49 CFR 386.72](#), [392.5](#), [392.9a](#), [395.13](#), or [396.9](#), or compatible laws, or the North American Standard Out-of-Service Criteria.

# Roadside Inspections

## Out-of-Service (OOS) criteria:

- No driver shall drive after being on duty in excess of the maximum periods permitted by this part.
- No driver required to maintain a record of duty status under [§ 395.8](#) or [§ 395.15 of this part](#) shall fail to have a record of duty status current on the day of examination and for the prior seven consecutive days.
- You will be put out-of-service for 24 hours if you have any detectable amount of alcohol under .04%. If your blood alcohol concentration (BAC) is .04% or more, you will lose your CDL for at least 1 year for a first offense.
- Federal and state inspectors also may inspect your vehicles. If they judge the vehicle to be unsafe, they will put it “out of service” until it is fixed.

# Roadside Inspections

## **Ramifications and penalties for operating a CMV when subject to an OOS order as defined in § 390.5.**

You will lose your CDL:

- For at least 90 days if you have committed your first violation of an OOS order.
- For at least one year if you have committed two violations of an OOS order in a 10-year period.
- For at least three years if you have committed three or more violations of an out-of-service order in a 10-year period.

# Unit 4.3 Maintenance

*This unit satisfies FMCSA's ELDT requirements for units A1.4.3, BA1.4.3, and B1.4.3.*

# Maintenance

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Vehicles and drivers are examined to ensure compliance with state statutes and federal regulations pertaining to vehicle equipment, load securement, driver qualifications, hours of service, and a host of other requirements.

# Maintenance

## General checking guidelines

- Is it cracked, bent, or broken?
- Is it properly mounted and secured?
- Are there any missing bolts or mounting hardware?
- Is it leaking?
- For belts: is it torn or cut? Is the tension is at the proper amount?

# Maintenance

## Engine

- Inspect any hoses and electrical wire to ensure they are properly mounted and secured, not cracked, bent, or broken, and any electrical wires aren't spliced, frayed or exposed.
- Check hoses to make sure there are no abrasions, bulges, or cuts. If they have fluid or air, check that they're not leaking.
- Check that your coolant reservoir is not cracked or broken and that it is properly mounted and secured, the cap is on tight, and it is filled to the manufacturer's specifications and above the minimum fill line.
- Inspect your water pump.



### OIL PRESSURE

- Idling 5-20 PSI
- Operating 35-75 PSI
- Low, Dropping, Fluctuating:  
**STOP IMMEDIATELY!**  
Without oil the engine can be destroyed rapidly



# Maintenance

## **Service Brakes, Including Trailer Brake Connections Inspection**

- Brake adjustment, either manually or with automatic slacks, ensuring their rate of travel is at the proper distance.
- Anti-lock brake warning light operation.
- Air hoses and tubing, preferably with the brakes applied.
- All hardware, ensuring it is in place and secure.
- The thickness of linings and drums.
- No presence of air leaks.
- The proper operation of the low-air warning system.

# Maintenance

## Tire Inspection

- Air pressure should be the same for all tires and not too high or too low.
- Tread should be 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 side wall.
- Cuts or damage
- Mismatched sizes
- Tread separation
- Dual tires that come in contact with each other or parts of the vehicle.
- Radial and bias-ply tires used together.
- Cut or cracked valve stems.
- Re-grooved, recapped or retreaded tires on the front wheels of a bus. These are prohibited.

# Maintenance

## 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 two (2) inches movement at the rim of a 20-inch steering wheel) can make it hard to steer.

# Maintenance

## 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 re-check 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.

# Maintenance

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## **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.

# Maintenance

## Suspension Systems

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 1/4 or more are missing, it will put the vehicle “out of service,” but any defect can 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.

# Unit 5.3 Hours of Service Requirements

*This unit satisfies FMCSA's ELDT requirements for units A1.5.3, BA1.5.3, B1.5.3, and C1.11.*

# Hours of Service (HOS) Requirements

The hours of service (HOS) regulations are designed to improve safety for the motoring public by reducing Commercial Motor Vehicle (CMV) driver fatigue.

There are different HOS regulations for Property-Carrying Drivers and Passenger-Carrying Drivers. This training covers Passenger-Carrying Drivers HOS regulations.

Source: [FMCSA](#)



# Hours of Service (HOS) Requirements

## Hours-of-service rules as they apply to intrastate transportation in Minnesota

### Who is Subject to the Hours of Service Rules?

- A For-Hire Motor Carrier
- A Private Carrier when operating vehicles over 10,000 pounds Gross Vehicle Weight (GVW)
- A Person transporting solid waste...including recyclable materials and waste tires, as described in 221.025(b), when operating a vehicle(s) with a GVW over 10,000 pounds or more
- A Person transporting hazardous material (HM) of a type or quantity that requires the vehicle to be marked or placarded
- A Transit Service receiving operating assistance from either MnDOT or the Metropolitan Council (MCTO, St. Cloud, and Duluth transit systems excepted).

# Hours of Service (HOS) Requirements

## Passenger-Carrying Drivers HOS Regulations

- **10-Hour Driving Limit:** May drive a maximum of 10 hours after 8 consecutive hours off duty.
- **15-Hour Limit:** May not drive after having been on duty for 15 hours, following 8 consecutive hours off duty. Off-duty time is not included in the 15-hour period.
- **60/70-Hour Limit:** May not drive after 60/70 hours on duty in 7/8 consecutive days.
- **Sleeper Berth Provision:** Drivers using a sleeper berth must take at least 8 hours in the sleeper berth and may split the sleeper berth time into two periods provided neither is less than 2 hours. All sleeper berth pairings **MUST** add up to at least 10 hours.
- **Adverse Driving Conditions:** Drivers are allowed to extend the 10-hour maximum driving time and 15-hour on-duty limit by up to 2 hours when adverse driving conditions are encountered.
- **Short-Haul Exception:** A driver is exempt from the requirements if the driver operates within a 150 air-mile radius of the normal work reporting location, and the driver does not exceed a maximum duty period of 14 hours. Drivers using the short-haul exception in §395.1(e)(1) must report and return to the normal work reporting location within 14 consecutive hours and stay within a 150 air-mile radius of the work reporting location.

# Hours of Service (HOS) Requirements

## Definitions of time

- **On-duty:** All time a driver spends performing work or being ready to work, until being relieved by the carrier of all responsibility. “On-duty” time also includes any compensated work performed by the driver for a carrier or non-motor carrier entity.
- **Driving:** All time spent at the driving controls of a commercial motor vehicle in operation.
- **Off-duty:** The driver has been relieved of all responsibilities for the vehicle and its cargo or passengers and the driver is free to pursue activities of his/her own choosing.
- **Sleeper Berth:** All time spent resting in a sleeper berth as defined in 49 CFR Section 393.76.

Carriers must maintain true and accurate records of a driver’s HOS. Drivers must record their daily activities on a Record of Duty Status (RODS), unless they meet all the conditions for the short haul provision or are otherwise excepted/exempted.

# Hours of Service (HOS) Requirements

## Electronic Logging Device (ELD)

- Technology that automatically records a driver's driving time and other HOS data. It monitors the engine run time, moving, miles and engine hours.
- All carriers and drivers subject to the HOS regulations must use ELDs unless exempted or excepted.
- Motor carriers and drivers may only use ELDs that are self-certified and registered on FMCSA's website: <https://eld.fmcsa.dot.gov/list>.

# Hours of Service (HOS) Requirements

## Exceptions to the ELD Rule:

- Drivers who operate under the Short-Haul Provision.
- Drivers who use paper RODS for not more than 8 days in any 30-day period.
- Drivers who conduct driveaway-towaway operations in which the vehicle being driven is the commodity being delivered.
- Drivers of vehicles manufactured before model year 2000.

**Record Retention:** At least six months.

# Hours of Service (HOS) Requirements

## What happens to drivers/carriers who violate the HOS rules?

- Drivers will be placed Out of Service (OOS) if they
  - Exceed maximum hours permitted at the time of the stop/inspection, or
  - Fail to keep proper record of duty status for current day and 7 prior consecutive days.
- An OOS driver shall not be required or permitted to drive, and a driver may not drive until they have hours available. Drivers may be issued citations when found to be in violation of the HOS rules.
- Carriers who require or permit drivers to violate the HOS rules may fined.
- Driving (or allowing a driver to drive) more than 3 hours beyond the 11-hour driving-time limit may be considered an “egregious” violation and make the carrier and/or driver subject to the maximum civil penalties. Fines to drivers can range from around \$1,000-\$19,000 depending on the severity. The carrier may also pay a fee. If the violation involves hazardous material, the fine can exceed \$75,000.

# Hours of Service (HOS) Requirements

## Tips to avoid and recognize fatigue

- **Get enough sleep before getting behind the wheel.** If you become drowsy while driving, be sure to choose a safe place to pull over and rest.
- **Maintain a healthy diet.** Skipping meals or eating at irregular times may lead to fatigue.
- **Take a nap.** Naps should last at least 10 minutes. An ideal nap is 45 minutes. Allow at least 15 minutes after waking to fully recover before starting to drive.
- **Avoid medication that may induce drowsiness.** Cold pills are one of the most common medications that make you drowsy. If you must drive with a cold, it is safer to suffer a cold than drive under the effects of the medicine.
- **Recognize the signals and dangers of drowsiness.** Frequent yawning, heavy eyes and blurred vision may indicate drowsy.
- **Do not rely on “alertness tricks” to keep you awake.** Behaviors such as smoking, turning up the radio, drinking coffee, opening the window, and other “alertness tricks” are not real cures for drowsiness and may give you a false sense of security.

# Unit 5.4 Fatigue and Wellness Awareness

*This unit satisfies FMCSA's ELDT requirements for units A1.5.4, BA1.5.4, B1.5.4, and C1.11.*



# Driver Fatigue

No driver shall operate a commercial motor vehicle, and a motor carrier shall not require or permit a driver to operate a commercial motor vehicle , while the driver's ability or alertness is so impaired, or so likely to become impaired, through fatigue, illness, or any other cause, as to make it unsafe for him/her to begin or continue to operate the commercial motor vehicle.

# Fatigue & Wellness Awareness

**According to FMCSA, these are the core risk factors for professional drivers**

- **Smoking:** increases heart disease, lung disease, and chance of contracting cancer
- **Obesity:** increases risk for cardiovascular diseases, hypertension and diabetes, can increase problems with arthritis, back, and joint pain.
- **Hypertension (high blood pressure):** increases risk of heart disease, kidney failure and stroke, symptoms may include fatigue, severe headache, chest pain, breathing difficulty, irregular heartbeat

Source: [\*National RTAP: Emergency Procedures for Rural Transit Drivers Training Module\*](#)

# Fatigue & Wellness Awareness

## Core risk factors for professional drivers:

**Stress:** increases the incidence of hypertension and cardiovascular, gastrointestinal and immune deficiencies, risk factor in other diseases like depression and obesity.

**Poor eating habits:** can be one of the most decisive factors in individual health.

**Lack of physical activity:** Can increase the risk of physiological illness such as depression, anxiety, and stress, as well as physical illnesses like obesity, heart disease, hypertension and some cancers.

Source: [\*National RTAP: Emergency Procedures for Rural Transit Drivers Training Module\*](#)

# Driver Fatigue

- In today's economy, many people have more than one job.
- You have many bills to pay, mouths to feed; and one job does not quite make it.
- So you pick-up a “part-time” job to make ends meet.
- Since there are only 24 hours in one day
  - You catch a nap here and there
  - Sleep 3 or 4 hours
  - Then start the day over

# Driver Fatigue

- **After a few days of this routine, you think you can do this**
- But then you notice that while you are driving,
  - You feel a little drowsy
  - You start shifting around in your seat
  - You stare blankly at the road
  - You do not remember the past few miles
  - You start yawning and your eyes close

# Driver Fatigue

[Driver Behavior Safety Series: Fatigue](#) — National Safety Council (1:12)



# Driver Fatigue

- According to a Sleep in America poll:
  - 1% or as many as **1.9 million drivers** have had a car crash or a near miss due to drowsiness in the past year
  - 54% or **105 million drivers** have driven while drowsy at least once in the past year
  - 28% or **54 million drivers** do so at least once per month
- Chronic and acute driver fatigue decreases your ability to recognize and respond to oncoming hazards. Fatigue impairs your driving, like alcohol impairment. Remember, you are driving a larger vehicle and larger vehicles can do more damage.
- Staying alert to be able to think clearly and quickly respond to potential hazards is an important factor to driver safety.

# Driver Fatigue

As a professional transit driver/operator you may be exposed to a broad array of biological, physical, & ergonomic hazards, as well as various stressors.



# Wellness Awareness

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## Musculoskeletal Disorders (MSDs)

MSDs are injuries or pain in the body's joints, ligaments, muscles, nerves, tendons, & structures that support limbs, neck, & back.

# Wellness Awareness

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## **Work-related Musculoskeletal Disorders (WMSDs)**

WMSDs can be associated with work patterns:

- Fixed or constrained body positions
- Force concentrated on small parts of the body

# Wellness Awareness

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- A pace of work that does not allow sufficient recovery
- Heat, cold, & vibration

# Wellness Awareness

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Things you can do to lessen the risks include:

- Adjust your driver seat area properly so that you have full access to all controls, permitting a comfortable arm position
- Adjust all mirrors properly

# Wellness Awareness

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- Adjust & re-adjust lumbar support throughout the day
- Take advantage of non-driving time to stretch your back & leg muscles. Stretching enhances circulation & reduces muscle tension.