Class 1 Mandatory Entry Level Training Classroom Theory

Lesson Plans

These classroom theory lesson plans are provided for Class 1 MELT schools to use or adapt for their course.

- Lessons in this manual may be done in any order
- You may mix and match activities to suit your students' needs and course design
- Many of the lessons include PowerPoint presentations, but not all
- Schools may use different or additional materials and activities provided that all course content is covered in a learner-centred way
- Homework assignments are encouraged as a way to extend the content and reinforce learning
- Review quizzes are provided for most units. Schools may use different or additional quizzes
- Please see the following companion documents available at https://dtcbc.com/driving-schools/melt/default.asp when planning your course:
  - MELT curriculum framework
  - MELT student guide
  - MELT practical assessment forms
  - Practical lesson plans
  - Presentation slides
  - Theoretical assessment (provided to schools once approved to deliver MELT)
  - Course record forms.

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Overview of the trucking industry

Unit overview

Part of MELT framework Module 1 - Overview of the trucking industry.

This first unit is designed to provide students with an overview of working in the trucking industry, an overview of the course and licensing requirements (including course assessments) and ensure that students appreciate the serious responsibility truck drivers have for safety.

Total time: Approximately 2 hours in the classroom

Materials required

- Student workbook
- Audio/visual equipment
- Slide presentation: Overview of the Trucking Industry.

Video list

WorkBC Career Trek video - Truck Driver (Episode 22) (5:17)

https://www.youtube.com/watch?v=A81nvDdP5KY

Learning outcomes from the MELT framework

1.1.1. Explains that workers and employers must comply with government regulations and standards.

1.1.2. Identifies that standards may apply to worker obligations, rights and responsibilities; employment; health and safety; labour agreements; etc.

1.1.5. Identifies that employment requirements may include: security screening and background checks; regular appraisals and performance reviews; pre-employment, periodic, or post-incident drug and alcohol testing.

1.1.6. Identifies that employment requirements will require medical clearance based on a specific type of driver's licence, and will also involve an initial and periodic physical assessment or fitness screening.

1.4.1. Explains that different classes of driver's licences apply to different types of vehicles and the required licence varies between Canadian jurisdictions.

1.4.2. Explains that a driver's licence may require specific endorsements for certain types of commercial vehicles and operations.

1.4.3. Explains that personal driving history, and medical condition and history, can affect the status of a worker's commercial licence and ability to drive commercial vehicles.

1.4.4. Explains that government agencies develop and retain records of driver incidents and infractions and commercial motor carrier incidents and infractions.

1.4.5. Identifies some of the medical conditions that may prohibit a driver from holding specific types of commercial driver's licences.

Course introduction and getting to know you

Time required: 20-30 minutes

Slide 1 - Welcome to MELT Class 1 Driver Training

Welcome students to the course.

Introduce yourself with brief background in trucking and teaching.

Slide 2 – About the facilities

Go over housekeeping items as needed – washrooms, breaks, emergency exits, smoking place, applicable health and safety rules.

Slide 3 – Goal of Mandatory Entry-level Training (MELT)

Review the goal of this course and answer any questions.

Explain that this course is designed to help reduce the number of crashes and incidents by ensuring that all new drivers have adequate control skills and knowledge and, most importantly, a responsible and professional approach to driving.

Slide 4 – Unit overview

Explain what students will learn in this first unit.

Activity

Slide 5 – Getting to know you…

This activity acts as an ice breaker for the students and provides a snap shot of students' experience and expectations. Time needed will depend on the class size.

Instructions

Divide the class into partners. Have the partners interview each other, for about three minutes using these questions:

- Why did you decide to take this course?
- What job would you like to get?
- What do you want to drive?
- Do you have any commercial driving experience?

Have the partners introduce each other to the rest of the group with the information from the interview.

What's the job like?

Time required: 20 minutes

Slide 6 – What's it like to be a commercial driver?

Brainstorm – What do think it's like to be a commercial truck driver? Acknowledge answers and probe as needed.

Introduce and show the video. This video provides an exciting and positive introduction to the job.

WorkBC Career Trek video - Truck Driver (Episode 22) (5:17)

https://www.youtube.com/watch?v=A81nvDdP5KY

Brian heads to Terrace where he meets a truck driver. He rides along and learns about local and long distance trips and other opportunities, such as running your own business or becoming a heavy equipment operator. This job can be like a "paid tourist".

Slide 7 - Equipment options for commercial driving

Review different types of equipment options a Class 1 driver may drive. Provide information about each based on your experience and knowledge.

- Tractors
- Trailers
- Straight trucks
- Specialty trucks

Slide 8 - Career options

Brainstorm – What might be some different career options in trucking?

Answers might include:

- Short-haul/regional delivery
- Long-haul "over-the-road" driving
- Local pick up and delivery
- Owner-operator
- Team driving

Slide 9 - 10 – Short vs. long-haul

Brainstorm and discuss the advantages and disadvantages of long and short-haul driving.

Short-haul advantages	Short-haul disadvantages
○ more time at home ○ familiar routes ○ more predictable ○ few log book worries ○ more time with family	○ inconsistent or seasonal work ○ long work days ○ lower income ○ more traffic challenges ○ more backing up and maneuvering
Long-haul advantages	**Long-haul disadvantages**
○ travel and scenery ○ independence ○ different challenges each day	○ being away from home ○ loneliness ○ time management ○ lifestyle, diet, fitness and health ○ unpredictable work

Driver licensing and course requirements

Time required: 10 minutes

Slides 11 - Driver licensing process

Review licensing process and clarify requirements.

- pre-trip inspection test
- air brakes endorsement
- road test
- driver's medical exam - some medical conditions that may prohibit a driver from holding a Class 1 licence include: heart disease, brain tumors, hearing problems, musculoskeletal conditions, vision impairments, sleep disorders, kidney disease.

Slide 12 - What you'll learn

Review what students will learn on the course.

- Vehicle inspections including the air brakes system
- Backing
- Coupling and uncoupling
- Sliding the 5th wheel and tandem trailer axles
- Driving in a variety of roadway, traffic, light and weather conditions
- Mountain driving
- Putting chains on a tire
- Basic cargo securement
- How to comply with hours of services regulations.

Slide 13 – OK, what do I have to do?

Review the completion and assessment requirements to qualify for a certificate and go for a pre-trip test and road test.

Issues in commercial truck safety

Time required: 30 minutes

Slide 14 – Commercial vehicle driving is a big responsibility

Review the slide.

Slide 15 - Top 10 incident types

Discuss the top 10 incident types.

The table shows WorkSafeBC's data from 2012 to 2016 listing the top 10 motor vehicle incident types for drivers employed in general trucking.

The incident type with the highest number of WorkSafe claims during this period was "jack-knifed or overturned" without involving a collision with another vehicle.

Ask: What do you think the key contributing factors to the number 1-ranked crash might have been?

Slide 16 - Canada's deadliest crashes involving a commercial vehicle

From the Student Guide, briefly discuss a few of Canada's deadliest crashes from the last few decades involving a commercial vehicle.

Slide 17 - Costs of crashes and incidents

Brainstorm – have students brainstorm all the costs and consequences of truck crashes and incidents.

Option - In small groups with flip chart paper and markers, have students do a webbing exercise for this activity.

There are many types of costs associated with a commercial truck incident. The costs take a tremendous toll on drivers and companies.

- visible (direct) costs
- hidden (indirect) costs
- human, psychological, and environmental costs

When a professional driver is involved in an incident, the costs could include:

- Cargo damage
- Vehicle damage
- Injury costs
- Medical costs
- Loss of revenue
- Administrative costs
- Insurance increases
- Towing costs
- Storage of damaged vehicle
- Loss of customers
- Lost sales
- Missed meetings
- Salaries paid to employees off injured
- Lost wages
- Cost to hire or train replacement workers
- Lost time
- Loss of personal property
- Vehicle replacement
- Equipment downtime
- Accelerated depreciation of equipment
- Accident reporting
- Fines and punitive damages
- Investigations and legal proceedings
- Medical costs
- Poor public relations & publicity
- Increased public relations costs
- Government agency costs (police, fire, ambulance)

Summary

The biggest contributing factor by far is driver error – sometimes the professional driver – but often other drivers. For this reason, professional drivers must always drive in a way that accommodates for the mistakes of others.

Employer expectations and requirements

Time required: 15-30 minutes

Slide 18

Discuss

Prospective employers are looking for more than the licence classes and endorsements a driver has. They might also ask you to provide:

- A completed employment application form.
- Personal driver's abstract and commercial driver's abstract (dated within 30 days).
- Medical information.
- A criminal record check (dated within a specified period).
- Records of your previous work experience and training that are relevant to your job.
- Consent to participate in periodic drug screening.

Some of these requirements may be required on a periodic basis. Failure to provide any of these may affect the status of your job.

Slide 19 - Additional training

Once you are hired, you will be required to participate in the employer's own training programs. Employers are required to provide additional training to their drivers including:

- Operation of specialized equipment or vehicle features
- Workplace orientation
- Loading and transportation of specific cargo
- Occupational health and safety rules
- Company policies (dress codes, code of conduct, disciplinary policies, substance abuse policies etc.)
- Duties and scope of your position, condition of employment, and so on.

Slide 20 - What are employers looking for in a new driver?

Review the slide, briefly discussing each point.

Discussion

Professional behaviour is most often characterized by the following attributes:

- Communication skills (more on this later in communications unit)
- Integrity and honesty
- Commitment to learning
- Competence in performing work
- Loyalty to the company/employer
- Responsibility and accountability
- A willingness to follow rules and policies.
- A commitment to maintaining confidentiality
- Good work habits – punctuality, meeting obligations
- Respectfulness, courtesy to fellow employees and customers

Slide 21 – Key responsibilities

Employers expect that you will have basic knowledge and understanding of the laws and other compliance requirements.

To be successful as a professional driver, you must ensure that you have a clean driving record.

Carriers are required by law to keep specific records on each driver's file for four calendar years after the driver files have been created, established or received.

According to *The Commercial Carrier Record-keeping and Commercial Vehicle Driver Reporting Regulations*, the following records must also be kept for each person who is authorized to drive an NSC vehicle for a carrier:

- The driver's completed application for employment
- A copy of the driver's abstract dated within 30 days of hire
- Annual updated copies of driver's abstract
- The driver's employment history for the preceding 3 years
- A record of the driver's conviction of safety laws relating to the operation of a motor vehicle in the current year and in each of the 4 preceding years
- A record of any administrative penalty imposed on the driver
- A record of all collisions involving a motor vehicle operated by the driver that are required to be reported to a peace officer
- A record of all training taken by a driver related to the operation of a vehicle and compliance with safety laws;
- A copy of any training certificate issued to the driver, in electronic or paper form, for the period starting on the date the training certificate is issued
- Alcohol and drug testing records are kept by carriers operating in the United States.

Activity

Slide 22 - Do you have what it takes?

This activity could be done in-class, time permitting or given as a homework assignment.

Option 1: In-class activity instructions

Refer students to the *Professional Driver Aptitude Quiz* in their workbook. Explain that the results are private, for their information only, and they are not required to share.

Allow about 5 minutes for students to complete it and another 15 minutes to review their answers and allow for discussion.

After they have completed the quiz, using the answer key, discuss each question as a group and the importance of the "best" answer.

Open it up for those who wish to share their results and thoughts.

Ask, are there any areas that you need to work on or steps might you take to improve your score?

Option 2: Homework assignment instructions

Complete the survey on your own time and afterwards compare your responses to the answer key that will be provided. Consider the question: are there any areas that you need to work on or steps might you take to improve your score?

In a later review session, provide a few minutes for students who would like to, to share their results and thoughts.

Professional driver aptitude quiz - answer key

"Best" answers are in bold.

1. Everyone handles stress differently, how would you rate your ability to perform under stress? Good.
2. Can you pass a drug test? **Yes.**
3. Do you want to drive a truck just for the money or because you think you might like it? **I think I will like it.**
4. Do you often regret the way you act when you get angry? **No.**
5. How would you rate your ability to manage your anger? **Above average.**
6. Have you had an impaired charge or open container alcohol related traffic violation in the past five years? **No.**
7. Have you had a speeding ticket of 20 km/h or more over the posted limit in the past three years? **No.**
8. If the people who know you best were asked if you were patient or impatient, what would they say? **Patient.**
9. Do you like to go out and drink on the weekends or after work during the week? **No.**
10. Do you consider yourself to be mechanically inclined? **Yes.**
11. Do you need constant company or are you ok being alone with yourself? **I am fine being alone**
12. How would you rate your ability to follow detailed directions? Above average.
13. Do you need to be supervised or do you have a strong work ethic? **I have a strong work ethic.**
14. How many crashes have you had that were your fault since you have had a driver's license? **None.**
15. Do you have the ability to make quick decisions without hesitation? **I am decisive.**
16. Do you consider yourself to be an excellent problem solver? **Yes**.

17. Do you find it difficult to ask others for help? **No.**

18. Do you have any experience driving in the snow? **Yes.**

19. Would you be able to lift 30kgs without a problem if you had to? **Yes.**

20. Have you ever quit and walked off a job without giving notice? **No.**

Optional lessons and activities

The content and activities in this section are optional. Instructors may use this material as they wish.

Optional homework activity – job search

Explain that the purpose of this activity is to help them become aware of the types and number of trucking jobs currently available in British Columbia.

Have the students do an internet search for truck driving jobs. Have them select one or two that interests them.

Discuss their results as a group in a later lesson.

Optional lesson - Applying for a job in commercial driving

Reference: Applying for a job in trucking, Student Guide

This is an optional lesson that could include the following:

- Explain that students can get a copy of their driver's abstract through ICBC
- Review the example resume and tips
- Have students review the sample job postings and write a resume
- In class or via web conference, have students practice job interviews.

Sample Job 1 - Class 1 Driver - Burnaby to Calgary Return

Mr. Snappy Overland Express, a leading Canadian transportation company since 1938, has an opening for the following position at its Burnaby terminal;

Company driver – Burnaby to Calgary (2 overnight runs per week)

The ideal candidate holds a valid Class 1 license, has a clean abstract, criminal record search, must pass a medical/drug test. The applicant should be fluent in English, familiar with mountain routes, regulations and have previous mountain experience. In addition, the successful applicant will have a safety focus to ensure the safe, secure transportation of goods.

Mr. Snappy has a very competitive pay package. We are committed to Employment Equity and encourages applications from all qualified persons.

Sample Job 2 - Welcome to Joe's Waste Management

We are a dynamic, growth-oriented and safety-focused company. Providing collection and processing for waste, recycling and organics, NFL stretches from across Canada with over 3,000 employees. With customer service and safety as our focus, we are looking for energetic and driven, Class 1 driver to support our growing company.

We offer the following:

- A healthy and safe workplace culture
- Continuous growth and opportunity for career advancement
- A competitive RRSP/DPSP program (after 1 year of employment), helping you plan for financial success down the road
- Modern and well-maintained equipment
- Comprehensive benefits package for you and your family.

Job Duties

- Pickup of waste at specified transfer stations and dispose of at designated landfill
- Secure walking floor trailer or roll off bin as per company procedure and inspect in transit as required
- Perform vehicles pre and post inspections daily, as well as checking gas, oil, and other fluid levels. Replenishing fluid levels when necessary
- Complete the necessary paperwork for vehicle inspection and submit to the Supervisor on a daily basis
- Other duties as assigned by your manager or management team.

Requirements

- Must have valid Class 1 or 3 License with air brake endorsement
- Ability to perform physical exertions such as repetitive lifting, pushing and pulling items that weight up to 30 pounds as part of their daily routine
- 1-2 years of previous driving experience and hauling a trailer in the transportation sector (i.e. truck and transfers, tandems, end dumps)
- Walking floor trailer experience is an asset
- Able to work in a variety of weather conditions with exposure to the outdoor elements
- Must have strong communication and interpersonal skills
- Excellent decision making skills
- Ability to follow specified guidelines and safety procedures
- Must maintain a professional appearance
- Ability to perform physical requirements of the position.

Optional activity – Practice interviews / role play

Suggested time: 30 minutes

Use role-play to help each student become comfortable in the interview situation. Discuss possible questions asked during interviews and have the group determine the best answers.

Role play – Ask someone to volunteer to play the role of the interviewer. Select one or more students to take turns interviewing for one of the jobs from the handouts they have from the previous exercise.

Once the interview has concluded, have student discuss went well and tips on how to do better.

Optional activity - How to write a resume

Have the students do an internet search (or the job posting samples) to look for commercial driving jobs. Choose one that appeals to them and write a resume. Have the students use the sample resume as a template (or any other template they like). This can be done during class time or as homework.

Tips:

- Your resume must clearly, concisely and strategically present your qualifications to get a recruiter interested in meeting you. It should convey your skills, work experience and assets.
- The resume is used to describe what you can accomplish professionally in a manner that also illustrates what you can do for an employer.
- Keep your resume clear and concise
- Proofread your resume numerous times
- Limit your resume to one page if possible
- Tailor your resume to suit the position you are applying for
- Highlight what you have accomplished
- Be honest
- Include volunteer and community work

Resources

BCTA job postings

https://www.bctrucking.com/careers/job-postings

Neuvoo - jobs

https://neuvoo.ca/jobs/truck-driver/

Trucknews.com

https://www.trucknews.com/driver-recruitment/

HRTrucking Canada

https://truckinghr.com/

Over the Road – jobs for truckers

http://www.overtheroad.ca/

Pro-trucker

http://pro-truckermagazine.com/

Private motor truck council of Canada

http://www.pmtc.ca/home/

BC Government: WorkBC

https://www.workbc.ca/Labour-Market-Industry/Industry-Information/Industry-Profiles/Transportation-and-Warehousing

Women in trucking

http://www.womenintrucking.org/

Auditor General of BC: An independent audit of commercial vehicle safety (2018)

https://www.bcauditor.com/pubs/2018/independent-audit-commercial-vehicle-safety

Fuel efficient driving

Unit overview

This unit focuses on fuel-efficient driving techniques for large diesel-powered commercial vehicles. In an increasingly environmentally conscious world with steadily rising fuel prices, it's critical that new drivers learn the latest fuel efficiency techniques. These techniques can save thousands of dollars per year in fuel costs, reduce greenhouse gas emissions, and improve road safety.

Part of MELT framework Module 3, Driving techniques.

Time required:

- 1 hour online homework assignment
- 15 minutes in the classroom for introduction and review.

Learning outcomes from the MELT framework

3.4 Use fuel efficient driving habits.

Learning indicators

3.4.1. Explains the economic and environmental importance of fuel-efficient driving methods.

3.4.2. Describes the use of different fuel types, vehicle technology, fuel additives, etc. to help reduce fuel consumption.

Performance elements

3.4.3. Accelerates at a smooth and gradual rate.

3.4.4. Anticipates when changes in speed, gear selection and surrounding space will be necessary.

3.4.5. Operates the engine and transmission close to the fuel-efficient rpm range whenever possible.

3.4.6. Chooses a fuel-efficient highway speed.

3.4.7. Uses progressive shifting and selects the engine rpm and gear that are best for the vehicle speed and load

3.4.8. Controls shift points by adjusting the throttle, when driving a vehicle with an automated transmission.

3.4.9. Looks ahead continually, anticipates the need to change speed, and changes speed gradually.

3.4.10. Uses cruise control whenever appropriate for driving conditions.

3.4.11. Idles the vehicle’s engine as little as possible.

3.4.12. Maintains tires for fuel-efficient road performance.

Introduction and online homework assignment

Time required: 5 minutes

Students are required to complete the Natural Resources Canada (NRCan) online course: *Smart driver for highway trucking* as part of their MELT program. The course is free.

Upon successful completion, students are issued a completion certificate that must be provided to the school (via email) as proof of completion. Keep these copies on file for auditing purposes.

If your school is certified by NRCan to provide the in-person course and issue the certificate, you may choose to do that instead of having students take the course online.

The link to the course is provided below.

https://smartdriver.eduperformance.com/client

Student will need to register for the course in order to take it.

Review and follow up

Time required: 10 minutes

Provide the additional information to students and do a follow up to the online course at an appropriate time during the course.

Fuelling a commercial vehicle

Key points

- Fill the tank on the passenger's side of the vehicle first, then return the nozzle and return to the main side to fill the driver's side tank
- Do not add fuel into the tank when the engine is running.
- Do not repeatedly enter and exit the vehicle while fuelling. Doing so can cause static build-up that can cause a static spark to occur when handling fuel nozzle
- Never overfill the fuel tank.
- In the event of a major or minor fuel spill, notify the attendant to get it cleaned up immediately using an approved absorbent material.
- Do not add fuel close to electrical sparks or open flame.
- DO NOT SMOKE and be sure no one around is smoking.
- Do not use a cell phone while fuelling.

Practical training connection

Students will learn to use fuel efficient driving techniques during on-road lessons. Instructors should ensure that students have made the link between how well-planned, smooth, and defensive driving affects safety and fuel efficiency.

Fueling a commercial vehicle activity

If possible, go to a fuelling station and coach students through the safe and correct procedure for fueling.

On-road coaching tips

The following information is from Natural Resources Canada (NRCan), *Smart driver for highway trucking* program.

Momentum management - Momentum management means planning ahead to keep the truck rolling with a minimum of fuel, by finding the sweet spot and avoiding use of the throttle, brakes and engine brake. The driver should plan trips to combine tasks at one stop; e.g. refuelling, meal, shower and/or delivery.

Once underway, the driver should look far ahead on the road and identify changing conditions (traffic flow, traffic lights, pedestrians, hills, low-speed turns, etc.) ahead of time. This practice allows the driver to adjust the vehicle speed while using the least amount of consumables (brakes and fuel).

Combine coasting and using the engine brake to slow or stop, to minimize wear on the brakes. For example, simple things such as backing out of the throttle early when approaching an exit from the highway and allowing the vehicle energy (speed) to dissipate (coast down) saves the fuel required to maintain speed until the exit and saves the brakes that would have otherwise been required to slow enough for the exit ramp.

Coach the driver to

- slow down by easing up on the throttle, finally releasing the throttle completely to allow the engine brake to engage
- allow the vehicle to slow before entering a turn. Ensure that the driver is in the correct gear to pull the trailer(s) through the turn, accelerating on exit.
- apply the following distance rule of thumb: allow 1 second for every 3 metres (10 feet) of vehicle length. Explain that proper following distance allows more time to react to changing conditions and managing momentum.
- anticipate changing conditions by being aware of surroundings – what is ahead, behind and beside the vehicle
- be aware of traffic lights – did they just change? Are they about to change? Does the pedestrian light provide clues as to when the light will change?
- expect the unexpected!

Eliminate unnecessary idle time - The engine should always be off unless it is performing some kind of work (building air pressure, etc.). Drivers need to create habits that support this objective, such as not having the engine running when they are completing paperwork. Shut the engine off during loading, off-loading, inspections, brake checks, etc.

Progressive shifting - Ensure that the driver is up-shifting to the next highest gear at the lowest possible revolutions per minute (rpm) that will keep the vehicle accelerating. Acceleration does not win the fuel consumption race. Coach the driver to take advantage of the half gears, if he/she is driving a 13- or 18-speed transmission. This keeps the rpm down all day because, with the smaller steps in these gears, your shift point can stay down in the peak torque range (1200–1500 rpm).

Speed management - This is similar to momentum management except for the reinforcement of the fact that simply slowing down will reduce your fuel consumption and the wear and tear on your vehicle! Generally, every 10 km/h above 90 km/h burns about 10 percent more fuel.

Resources

Super single tire article from The Western Producer

https://www.producer.com/2019/03/rules-streamlined-for-super-single-semi-tires/

Human trafficking

Unit overview

Modern-day slavery, or human trafficking exists whenever people are bought and sold for forced labour or commercial sex. As the eyes and ears of the nation's highways, members of trucking industry are in a unique position to help in the fight against this crime.

Traffickers "sell" their victims – girls and boys as young as 11 or 12 – at truck stops, travel plazas, rest stops and "massage" parlours.

Making the call is as simple as dialing 911 or the National Human Trafficking Hotline number. Asking if the girl or boy needs help makes a huge difference in the fight against human trafficking.

Time required:

- Classroom time: 10 - 15 minutes
- Online time: 30 minutes.

Learning outcomes from the MELT framework

1.5.1 Describe several signs that human trafficking may be occurring.

1.5.2 Explain how to report human trafficking.

Instructions

Provide students with the link to the TAT website and assign the video and questions as a homework assignment. Give students several weeks to complete the video.

At an appropriate place in class have a follow up discussion. Briefly discuss the video students watched at home. Prompt discussion with questions such as:

- What surprised or stood out for you in the video?
- Did the video change your perception about prostitution and human trafficking? How?

Resources and link to the course

Article from trucknews.com on expansion of Truckers Against Trafficking (TAT) expanding into Canada. https://www.trucknews.com/health-safety/truckers-against-trafficking-expands-into-canada/1003093894/

Truckers Against Trafficking website:
https://truckersagainsttrafficking.org/

Link to training video:
https://education.truckersagainsttrafficking.org/lesson/the-tat-training-video/

IMPORTANT: remind student to not watch the video from the home page - that will not give them the certificate. They must register for the course first under the "TAT Trained" tab.

Vehicle components and systems

Unit overview

Time to complete this unit:

- 3.5 hours in the classroom
- 2 hours in the yard with up to four students per instructor

Materials

- Vehicle components and systems checklist
- Student workbook
- Audio/visual equipment
- Whiteboard or flipchart and markers
- Two slide presentations:
  - Vehicle gauges and switches
  - Vehicle components and systems.

It is recommended that the material be presented in the classroom, followed by an in-yard activity.

Consider breaking the content into parts and delivering on different days rather than all at once. This is a lot of information to take in.

Learning outcomes from the MELT framework

2.1 Operate commercial vehicle systems and controls

Learning indicators

2.1.1. Describes the general components and basic function of a typical commercial vehicle engine compartment and fluid systems.

2.1.2. Describes the general layout and function of major body, frame and external vehicle components and systems.

2.1.3. Explains the differences between single, tandem, tridem and other multi-axle configurations.

2.1.4. Describes the basic types, features and function of tires and wheels.

2.1.5. Describes the physical features and operation of common types of suspension systems.

2.1.6. Describes the physical features and basic operation of drum and disc brake systems

2.1.7. Describes the way that Anti-lock Brake Systems (ABS) keep wheels from locking, but may not shorten vehicle stopping distance.

2.1.8. Describes how stability control systems operate and affect vehicle operation.

2.1.9. Describes the physical features, indicators, warnings, and the basic operation of hydraulic systems.

2.1.10. Describes different types of trailer coupling devices.

Performance elements

2.1.11. Locates and operates all typical primary and secondary controls, gauges and instruments.

2.1.12. Explains the instrument panel indicators displaying important vehicle operating information, warnings and safety system status.

2.1.13. Operates one or more typical manual transmission and clutch, automated manual transmission and/or automatic transmission.

2.1.14. Locates fuel tanks and filler caps, and apply proper fuelling methods.

2.1.15 Identifies important commercial vehicle service items, and locates operating fluid check points.

2.1.16. Identifies the correct operating fluids required for a vehicle and how to properly re-fill and maintain fluid levels.

2.1.17. Operates a differential lock or inter-axle differential lock, if equipped.

2.1.18. Operates engine brake or retarders, and understands how and when to appropriately use these systems to control vehicle speed.

2.1.19. Operates vehicle heating, defrosting and air-conditioning systems.

2.1.20. Operates vehicle lamps and accessories.

2.1.21. Operates windshield wiper and washer systems.

Vehicle components and systems

The purpose of this unit is to familiarize students with the systems of a tractor trailer and how they function and work together. This will be reinforced during vehicle inspections and practical training.

Use information from the student guide, slides provided, and any other supplemental information you wish to use.

Emphasize that although the students may be overwhelmed by the vehicle systems at first, over time they will recognize them with ease.

Gauges, switches, warning lights and indicator symbols

The purpose of this section is to familiarize students with the information available on the dash of a typical tractor-trailer. It outlines the location and function of typical gauges, and the normal operating range for each and what to do when you see these light up.

Ignoring or not understanding the meaning of a warning symbol or the reading on a gauge can have serious consequences on the road.

Some controls, systems and instruments are unique to a truck/tractor trailer and may not be found in other types of vehicles. It is important that drivers consult the vehicle manufacturer’s manual to identify the vehicle’s components and functions and to determine if the components or systems are functioning optimally.

Emphasize that although the students may be overwhelmed at first by the number of controls and gauges, with experience they will know how to use them with ease.

Gauges

The instrument panel in large trucks vary in style and the number of gauges present. For each instrument or gauge, there is a correct and incorrect operating range. For example, a professional driver should know just by looking at their oil pressure, oil temperature, and water temperature gauges if they are in the correct operating range. Drivers need to continuously monitor the gauges for any deviations from the safe operating ranges listed in the vehicle operators manual.

Activity – video: 2004 Peterbilt379 Gauges Tour

Dave reviews each gauge on the dashboard of his 2004 Peterbilt 379

https://youtu.be/b2c564JGgcI (9:16)

Switches

Switches are either off or on, engaged or not engaged. They are not only operated electrically; some switches are operated by air. Switches control important functions, so it is essential to know where they are, when to use them, and if they are in the correct operating position.

Different manufacturers of trucks will have different types, styles, and configurations of switches. The switches will be identified by either names or symbols. They could be rocker, toggle, button, or some other style. For these reasons, it is very important that you become familiar with all of the controls of the vehicle you are driving, and refer to the owner's manual if necessary.

Activity – video: T880 Kenworth - switches, cab climate & gauges (3:01)

https://youtu.be/Pzk9Xb3EWkA

Warning lights and indicator symbols

Like all vehicles, trucks are equipped with warning lights and symbols to inform the driver that a system or component needs attention or is outside the safe operating range. Anytime a warning light is illuminated, it typically indicates a problem with the system. Depending on the warning light you may need to pull off the road as soon as possible to determine the problem, and in some cases, shut off the engine to avoid further damage.

Symbols, lights, and colours may differ slightly between manufacturers. Refer to the owner's manual before driving.

Review quiz

Time required: 15 minutes

In pairs or small groups, have the students complete the review quiz in their workbook. Discuss the answers using the answer key.

Practical training connection

Time required: 2 hours

Group yard activity

This is a good topic to initially introduce to students as a group. You can have up to four students for each instructor.

With the whole class, move to the yard.

Set up the tractor with the hood open, wheels blocked. Set up the trailer behind but don't connect the trailer to the tractor.

Demonstrate the 3-points of contact for getting into and out of the cab.

Show and discuss the various components and controls.

In groups of four, have students find and identify the various vehicle components, gauges, controls, warning lights and switches. Students could use the vehicle components and systems checklist to check off each item as they identify it.

Have them tour different types of tractors and trailers, if available.

Alternate - one to one activity

Alternately, all of the practical component of this topic could be taught as part of practical lessons with students being introduced to components, gauges and switches as they are needed.

Note: Two hours of time would need to be added to the practical lessons to accommodate for this content and meet minimum hour requirements.

Vehicle components and systems checklist

Vehicle body and frame
- ☐ hood or engine enclosure
- ☐ cab - vehicle body
- ☐ seat & seatbelts
- ☐ fenders/mud flaps
- ☐ mirrors
- ☐ doors
- ☐ frame

Suspension system
- ☐ suspension & frame attachments
- ☐ front tractor axle
- ☐ rear tractor axles
- ☐ single axle (if applicable)
- ☐ tandem axle
- ☐ tridem axle (if applicable)
- ☐ air suspension
- ☐ shock absorber
- ☐ drive shaft

Engine
- ☐ engine block
- ☐ fuel filter (if visible)
- ☐ computer management system

Fuel system
- ☐ fuel tanks
- ☐ fuel caps
- ☐ fuel filters

Air intake and exhaust system
- ☐ exhaust system
- ☐ mufflers
- ☐ air intake system (if visible)
- ☐ turbocharger (if visible)
- ☐ aftercooler (if visible)

Lubrication system
- ☐ power steering system
- ☐ oil dip stick
- ☐ applicable hoses and clamps
- ☐ oil filter

Coolant system
- ☐ Radiator and radiator cap
- ☐ fan belt and blades
- ☐ coolant

Brake systems
- ☐ disc brake system
- ☐ drum brake system
- ☐ air compressor
- ☐ governor
- ☐ air tank and valves

Electrical systems
- ☐ battery and battery cable
- ☐ wires
- ☐ ignition circuit
- ☐ cranking circuit
- ☐ alternators and generators

Drivetrain
- ☐ accelerator pedal
- ☐ transmission (if visible)
- ☐ clutch and clutch pedal
- ☐ gearshift lever
- ☐ foot valve
- ☐ parking brakes

Tires and wheels
- ☐ wheel hub/bearing
- ☐ wheel rim
- ☐ wheel fasteners
- ☐ mounting systems
- ☐ tires

Steering systems
- ☐ steering components
- ☐ roll stability systems

Coupling systems
- ☐ fifth wheel
- ☐ trailer kingpin
- ☐ roll coupling hitch
- ☐ landing gear
- ☐ pintle hitch

Vehicle components and systems review quiz – answer key

1. Which part connects the wheels to the rest of the vehicle and also supports the weight of the vehicle? (Axles)

2. Which system is the oil filter part of? (Lubricating system)

3. What recharges the battery when it loses electricity? (Alternators)

4. What shows whether the battery is charging properly? (Voltmeter)

5. This part is at each end of the driveshaft and can move in almost any direction. (Universal joint)

6. When a tractor manoeuvres around a corner, which part allows the outside wheels rotate faster than the inside wheels? (Differential)

7. Regarding air pressure in the tires, which of the following statements is true? Air pressure should be checked with an accurate gauge at least once a week when the tires are cool

8. Which of the following is not part of the drive train? (Kingpin)

9. Which of the following statements is incorrect regarding the clutch brake? (It is used in emergency situations to stop the vehicle)

10. Which of the following slows the vehicle by altering the valve timing which turns the engine into an air compressor? (Engine brake)

11. The interaxle differential lock control…(is used to equalize power to the axles to help keep the wheels without traction from spinning)

12. The trailer brake hand valve…(operates the service brakes on the trailer only)

13. If the coolant temperature gauge registers as overheating, the driver should…(shut down the engine at once)

14. What does it mean if air suspension light is on? (The air suspension is in the lowered position)

15. What does a PDL light on the dash mean? (The power divider is engaged)

16. What does an illuminated yellow light on the driver's side rear of a trailer signify? (The trailer has a malfunctioning ABS system)

17. If the voltmeter is at 10 volts while the truck is running what does this indicate? (There is a problem with the charging system)

18. Driving with the low diesel exhaust fluid (DEF) light illumined could…(cause the engine to derate/ limp mode)

19. What is the proper adjustment travel on a disc brake? (None of the above)

20. A convertor with two draw bars is used to make what type of combination train? (C train)

Air brakes single unit

Unit overview

This single-unit air brakes lesson is applicable to all types of air brakes equipped vehicles, including straight trucks, buses, motorhomes, forklift trucks, and so on.

This information can be used to offer a stand-alone single-unit air brakes course, as part of an air brakes certification course (where an additional four hours of practical training would be added), or as part of a Class 1 MELT course.

Total time:

- 7 hours in the classroom
- 2 hour in the yard (for Class 1 students), or
- 4 hours in the yard for certification students (optional).

Materials required

- Audio/visual equipment
- Whiteboard or flipchart and markers
- Slide presentation.

Optional materials

- Model foundation brake assembly
- Air brakes board
- Air brakes components
- Simulation program such as *Air Brakes Interactive*.

Videos

There are numerous videos available on the Internet in a variety of languages. Schools should choose a few short videos to use at appropriate times during this lesson. Providing students with video links to review on their own time can help reinforce the learning.

The following video links are provided as an option:

- Court animation depicting the components and operation of a commercial vehicle air brake system. Commercial vehicle air brakes: https://youtu.be/OZ6l9J6NK5s (3.02)
- Air disk brake inspection: Garage Gurus, Feb. 2, 2018 https://www.youtube.com/watch?v=wLMY5FB1POY (2.10)

General instructions

Slides are provided as an option to teach the content. Schools may use additional or different slides, provided that all of the required content is covered.

Instructors should ask questions regularly to check for understanding before moving on to a new topics.

There are several activities to include in the training. These are designed to help student solidify their knowledge.

There is a review quiz provided. You may use additional or different quizzes if you choose.

Suggested syllabus for air brakes single unit

Add breaks where appropriate

	Minutes
Introduction	15
• Slides 1-6	
Introduction to air brakes and heavy vehicle braking	60
• Slides 7-23	
Air brakes components	100
• Slides 24-52 • Video - animation	
Other types of foundation brakes	15
• Slides 53-56 • Video	
Other air brake system components	15
• Slides 57-60	
Components review	30
• Matching activity	
Brake adjustment	60
• Slides 61-65 • Activity – manual slack adjustment	
Air brake pre-trip inspection	60
• Slides 66-78	
Step story activity	20
Air brakes review quiz	30
Pre-trip test at ICBC	15
Total course time	420 (7 hours)

Learning outcomes from the MELT framework

The following learning outcomes from the MELT curriculum framework are covered in the single unit air brakes course.

2.1.7. Describes the way that anti-lock brakes systems (ABS) keep wheels from locking, but may not shorten vehicle stopping distance.

4.1.23. Maintains an appropriate following distance in all driving conditions.

10.1. Operate air brake equipped vehicles safely and in compliance with the applicable regulations.

Learning Indicators

10.1.1. Explains the role and importance of air brakes safety regulations and potential driver safety hazards related to air brakes.

10.1.2. Explains the basic operating principles of air brakes, including an air-over-hydraulic brake system.

10.1.3. Describes operation of supply sub-system.

10.1.4. Describes operation of service brake sub-system.

10.1.5. Describes operation of spring (parking/emergency) brake sub-system.

10.1.7. Explains the basic function of foundation brakes and related components.

10.1.8. Explains the effect of speed and weight on vehicle braking.

10.1.9. Describes effect of brake adjustment on vehicle braking ability.

10.1.10. Describes conditions such as brake fade, brake lag, and overheated brakes.

10.1.11. Identifies common brake types and recognize many of the components.

10.1.12. Explains the function and condition of air tank drain valves.

10.2 Conduct pre-trip and en route air brake inspections and identify any minor or major defects.

Learning Indicators

10.2.1. Identifies tools and supplies needed to conduct the pre-trip.

10.2.2. Explains how to identify damaged, missing or malfunctioning foundation brake components.

10.2.3. Explains how to identify cracked, loose, missing or contaminated brake lining, improper drum contact.

10.2.4. Explains how to identify overheated brake drums.

10.2.5. Explains how to identify any audible air leaks and visible evidence of cracks and non-manufactured holes in brake chambers.

10.2.6. Explains how to identify mismatched brake chamber size and/or slack adjuster length on steering axles.

10.2.7. Explains how to identify cracked and/or broken brake drums or rotors.

10.2.8. Explains how to identify leaks, damage, deterioration and improper fittings on readily visible brake hoses and air lines.

10.2.9. Explains how to identify insecure air compressor mounts, brackets or fastener and fluid leaks.

10.2.10. Explains what to check on the air system during an en route “brake check” inspection.

Performance Elements

10.2.11. Secures the vehicle for the pre-trip inspection.

10.2.12. Inspects all air brake system components for visible damage.

10.2.13. Describes correct response to brake system defects.

10.2.14. Identifies and locates supply tank.

10.2.15. Identifies if air tanks are securely mounted.

10.2.16. Measures air pressure build-up time.

10.2.17. Identifies air compressor governor cut-out and cut-in pressure.

10.2.18. Tests for air loss in the system.

10.2.19. Tests the low air pressure warning device, both audible and visual.

10.2.20. Tests function of service brakes on tractor (foot valve).

10.2.21. Tests function of spring (parking/emergency) brakes.

10.3. Check and adjust air brake pushrod travel.

Learning Indicators

10.3.1. Explains why air brake adjustment needs to be checked regularly.

10.3.2. Differentiates between manual and automatic slack adjusters.

10.3.3. Explains the advantage of automatic slack adjusters.

10.3.4. Differentiates between different brake chamber types.

Performance Elements

10.3.5. Measures brake pushrod travel accurately using both the applied stroke and hand pull (pry) method.

10.3.6. Identifies when pushrod stroke is longer than the prescribed limit based on chamber type.

10.3.7. Adjusts brake pushrod travel correctly based on the brake chamber type.

Introduction

Time required approximately: 15 minutes

Slides 1 - 6

Slide 1 – Welcome to the B.C. Air Brake Course

Provide a self-introduction, including your background with commercial vehicles.

If there are non-MELT students in the class, explain that the course covers information needed to write the air brakes knowledge test at ICBC.

If applicable, explain that there are students in the course who are in different training streams.

- For those not upgrading their licence to Class 1, 2, or 3, practical training and the pre-trip assessment is included (explain when this will occur).
- If your course is not an air brakes certification course, explain that students will go to ICBC for the practical pre-trip test.
- Class 1 MELT students will receive additional theory for trailers and plenty of practical training as part of their MELT course. The air brakes pre-trip test (part of vehicle inspection) will be conducted by ICBC as part of your road test.

Slide 2 – About the facilities

Explain housekeeping information:

- Washrooms
- Coffee and lunch facilities and breaks
- Emergency exits / muster area
- Cell phones
- Public health requirements, if applicable.

Slide 3 – Course overview

Provide a brief overview of the course:

- The importance of air brake inspections
- Basics of how air brakes systems work
- Components of a single unit air system
- Air brake pre-trip and en route inspections
- Identifying major and minor defects in the air system
- How to check and adjust air brake pushrod travel.
-

Slide 4 - Licensing

Explain the requirements for an air brakes endorsement (Code 15)

- To operate vehicles equipped with air brakes on a highway (other than a vehicle defined as a construction vehicle), you must have a B.C. driver's licence with an air brakes endorsement
- An air brakes endorsement is also required to operate most vehicles equipped with air-over-hydraulic brakes – if the vehicle has an air activated.

Slide 5 – How to apply for an air brakes endorsement

- Explain the steps to getting an air brake endorsement (non-MELT students)*
- Book you knowledge test online at icbc.com
- Study the air brake sections in the Driving Commercial Vehicles (DCV) guide to prepare
- Present your course card when you attend for your test
- Provide primary and secondary ID and pay the test fee ($15)
- Acceptable ID is listed on inside back cover of the DCV guide or on icbc.com

*As of October 18, 2021, MELT students will write the air brake knowledge test as part of the Class 1 knowledge test before beginning the MELT course.

Slide 6 – Air brake knowledge test

- The knowledge test is multiple choice
- The test is offered in English only. Translators are not allowed
- You must get 20 out of 25 questions correct
- If unsuccessful, you must wait seven days to try again
- Three attempts are allowed – after that you must retake the course
- Explain they can skip questions if they are unsure of the answer, but the question will come up again to finish the test
- Test results are valid for one year. If you haven't had the air brake endorsement placed on your driver's licence, by passing the practical test, within one year of passing the air brake knowledge test, you will need to take the knowledge test again.

NOTE: If you have Class 4, 5, or 7 non-certification students in the class, explain that they must book an appointment to take the air brake pre-trip inspection test at ICBC and provide an air brakes-equipped vehicle.

-

Introduction to air brakes and heavy vehicle braking

Time required: 60 minutes

Slides 7-23

Slide 7

Give a general introduction to air brakes.

- Air brakes are used as an alternative to hydraulic brakes which are used on lighter vehicles such as automobiles
- Hydraulic brakes use a liquid (hydraulic fluid) to transfer pressure from the brake pedal to the brakes to stop the vehicle
- Air brakes are used in heavy commercial vehicles due to their reliability.

Slide 8 – Why do we have air brakes?

Air brake systems:

- Use a much greater force to apply the brakes than hydraulic braking systems do, which is needed to cope with the heavy loads of commercial vehicles
- Are more tolerant to small leaks, which in a hydraulic system could result in brake failure
- An air brake system includes a compressor to generate more compressed air as needed
- Are capable of stopping heavy commercial vehicles safely.

Ask: What is the advantage of being able to generate more air with a compressor?

(If you have a loss of fluid in a hydraulic system, you have lost your braking power).

Slide 9 - What is compressed air?

- Air can be compressed (squeezed) into a much smaller space than it would normally occupy
- For example, tires are filled with compressed air to support the weight of a vehicle. Squeezing air into a smaller space increases the air's resistance
- This resistance creates pressure, which can be converted into mechanical force to apply the brakes
- Air brakes are able to generate more braking force than hydraulic brakes.

Slide 10 - Heavy vehicle braking

- **Heat** is a form of energy
- In an internal combustion engine, the heat energy produced by engine is converted to the **energy of motion** through the moving parts of the engine and drive train, turning the wheels
- When stopping a vehicle, the **energy of motion** is turned into the **energy of heat** through **friction** between the lining/pad and drum/rotor brakes

Advise that the final factor that is going to determine stopping distance is traction**.**

Slide 11 - Heavy vehicle braking cont.

- Discuss heat and the circle of heat
- Ask: *What happens to the heat generated by the brakes*?
- (The heat generated from braking is absorbed by the drum or disc and released to the atmosphere.

Slides 12-13 - Stopping distance and stopping time

Total stopping distance is the distance your vehicle will travel from the moment you:

- see — a hazard
- think — decide to stop
- do — place your foot on the brake pedal until you stop.

It takes about 3/4 of a second of perception time to see the problem (see-think) and another 3/4 of a second to react (do). Only then will your vehicle begin to slow down.

Explain that total stopping distance or time depends on the ability of the brake linings or pads to produce friction, the brake drums to dissipate heat, and the tires to grip the road.

Ask: what else can affect your stopping distance? (I.e. brake shoe or pads worn, drums or rotors worn, tires worn, road conditions, up or down hill.)

Explain brake lag

- A car's brakes begin to work almost instantly when you press on the brake pedal, but this is not the case when operating a vehicle with air brakes.
- There's a brake lag time of approximately 4/10 of a second from when you apply the brake pedal (foot valve) to when the air reaches the wheel and applies the brake.
- Add to this the braking distance, which is the distance the vehicle travels after the brakes are applied until it stops.

Ask: What happens to the stopping distance if you're coming down a hill? (It will be longer)

Advise that the final factor that is going to determine stopping distance is traction**.**

Slide 14 – Importance of following distance

- Discuss the following distances as set out on the slide
- Cars and light truck drivers follow the two-three second rule
- Large heavy vehicles – minimum of five seconds behind the vehicle ahead at highway speeds or one second for every ten feet of total vehicle length. This could be up to seven seconds with a fully loaded trailer
- Stay even further back when conditions are less than ideal
- Explain that these are minimum following distances in ideal conditions.
- Ask: how do you count following distance? Demonstrate if no one knows.
- Stress that the heavier the vehicle, the greater the following distance should be
- Ask: what could affect your following distance?

Slides 15 – Stopping power required to stop a vehicle

- Discuss how speed and weight affects stopping distances.
- 2 × vehicle speed requires 4 × the stopping power
- 2 × vehicle weight requires 2 × the stopping power
- 2 × vehicle speed and 2 × vehicle weight requires 8 × the stopping power
- Ask the class which has more of an effect, speed or weight?
- Increasing speed causes the stopping distance to increase faster than increasing the weight.

Slides 16-17 - How much heat can the braking system handle?

- Explain the brake drums and linings absorb the heat created by the friction of the brake shoes rubbing against the drum to stop the vehicle – this heat is dissipated into the atmosphere
- Normal operating temperature of the brake drums is between 120 and 250 degrees Celsius
- If the temperature of the drum exceeds 300 degrees Celsius brake failure may occur
- Ask: as the drums heat up what is happening with the drum? (It is expanding away from the brake shoes).

Brake fade

- Discuss the term **brake fade** - this is what is happening as the drums heat up and expand away from the brake shoes
- You'll need to apply more pressure to maintain the same braking force as brake fade increases
- If the drum continues to heat up and move away from the shoes. The brakes won't work – you're having a runaway!
- If the temperature continues to rise it may result in a brake fire
- Discuss that disc brakes are better at reducing brake fade then drum brakes as most discs have cooling vents
- Brake fade will still occur with disc brakes however it is not cause by the expanding away from the pads but rather a term called "gassing"
- Gassing is when a layer of gases caused by heat buildup between the pads and the disc reducing the ability of the pad to grab the disc.

Slides 18-19 - Engine retarders

- Engine retarders provide an additional (or auxiliary) way of slowing of the vehicle
- They, along with the appropriate gear, should be used to control speed on long downgrades
- Engine retarders (also known as engine brakes) help save the main braking system for emergency stopping.
- Discuss the different types of engine retarders

Four main types of retarders:

- engine retarders
- exhaust retarders
- hydraulic driveline retarders
- electric driveline retarders.

Using retarders

- More efficient at a higher engine rpm and a lower vehicle speed - it's important to select the right gear
- Select gear before start down the hill - more likely to miss a shift if you wait until you're on the downgrade
- Be cautious if you're using retarders/engine brakes on slippery roads – this can cause lock up, engine stall, loss of control or a jackknife if towing a trailer
- A modern truck with an engine retarder and properly maintained muffler system shouldn't be noisy
- Many municipalities post signs restricting drivers from using engine retarders/engine brakes
- Engine retarders are not a replacement for a well maintain braking system but a tool to aid with the braking
- Discuss they work best at a higher RPM
- Discuss that exhaust brakes are usually use on light to medium weight vehicles
- The other types are usually used on heavier types of vehicles
- Explain that the brake pedal on the air system will feel different then their car

Ask: What will be some of the determining factors if use of the retarder is necessary?

Review stopping on icy roads and if the retarder should be used and what may happen. Does this apply to wet roads?

When should we not use the retarder?

Slide 20-21 – En route brake checks

- Discuss that commercial vehicles licenced over 5500 KG need to check brakes at posted brake checks before descending steep hills
- Discuss the steps as shown on the sign explain how to perform these checks.

Slide 22 - Run away Lanes

Briefly discuss what to do in the event of a total loss of brakes.

- The most common cause of downhill runaways is travelling at a speed that requires you to use your service brakes
- Runaway lanes are located beside the road on some downhill grades
- These lanes are there to help slow and stop vehicles if their brakes fail
- These lanes are there for safety. Don’t use them for any other purpose.
- Some brake checks will have a diagram of the hill and where runaway lanes are located
- Explain there are different types of runaway lanes. Discuss what do at each:
    - Arrester beds - keep the wheels straight as you enter the bed allow the vehicle to come to a stop
    - Run-away lanes - when you come to a stop at the top, turn the truck off, put the transmission in lowest gear, and set spring brakes.

Slide 23 – Anti-lock braking system (ABS)

- Additional to a normal air brake system
- Doesn't allow you to drive faster or stop sooner
- Stopping distance may be longer on some surfaces such as gravel
- Can prevent wheel lock-up on slippery surfaces
- You can brake hard and maintain steering control. Do not pump the brakes
- Only as good as the driver - learn the correct technique and practice so you're ready in an emergency. Read your vehicle manual.

How it works

- If the brakes are applied too hard for road conditions, and a wheel lockup occurs, the **Electronic Control Unit (ECU)** senses the sudden drop in wheel speed and signals valves to release air pressure from the brake chambers at the affected wheels
- As the brakes begin to release, the wheels will begin to turn and the ECU will allow the brakes to re-apply
- If the lockup re-occurs, the apply-and-release cycle will repeat as often as necessary
- To achieve the shortest possible stopping distance on extremely slippery surfaces, you simply have to apply and maintain firm continuous pressure on the brake pedal

Ask if students have ever had their ABS activate? What was it like?

- Explain that on some vehicles that they may feel a vibration this is normal and they need to keep a steady pressure on the pedal. If they release the foot valve, their stopping distance will be lengthened.
- Stress that in a single unit vehicle, if their ABS has activated, they have likely done something wrong and lost traction – i.e. driving too fast for conditions, late braking, braking too hard or suddenly. Drivers should aim for smooth, well planned driving that doesn't risk loss of traction.

Air brakes components

Time required approximately: 100 minutes

Slides 24-52

Explain that you are now going to discuss each component of the air brakes system in detail.

If you have component parts available in class, show these to students.

Slide 24 - Basic air brakes components

This slide is an introduction to the section. Don’t get into detail.

Explain that these are the six basic components of the air brake system and we’ll go over each one in detail.

- Air compressor
- Governor
- Air lines
- Air reservoirs
- Foot valve (brake pedal)
- Foundation brakes.

Foundation brakes

Slide 25 – Brake chamber components

- The diaphragm converts air pressure to mechanical force. The diaphragm size determines the force
- An example would be if 100 PSI is applied against a 30-inch diaphragm it would produce 3000 PSI of force
- As it inflates, the diaphragm pushes against a plate attached to the push rod
- The push rod is attached to a slack adjuster which converts the pushing motion to a twisting motion. The slack adjustor has other jobs, as the name implies, it removes the slack between the brake shoes and the drum. It also serves as a lever to increase force in applying the brakes
- The slack adjustor twists the S-cam which in turn forces the brake shoes against the drum.
- The S-cam is a shaft with splines on one end which fits into the slack adjustor and has an S shape on the other which is used to force the brake shoes against the drum.

Slide 26 – Long stroke and regular stroke brake chambers

- Explain how to identify long stroke and regular brake chambers
- Discuss different sizes. The most common on drive axles is a type 30 explain what that means.
- Many new air brake systems have long stroke brake chambers, this has a longer pushrod stroke than the pushrod of a standard brake chamber.
- They are identified by their square-shaped inlet ports and/or trapezoid-shaped name tag on a clamp bolt.
- Explain that the advantage of the long stroke is you have ½ inch extra in stroke on the push rod.

Slide 27 - Foundation brake

- Explain that the brake assembly at each wheel is commonly called the foundation brake
- Explain that the assembly consists of the brake parts around the wheel that are operated by the air brake system, including the brake chamber
- The most popular type of foundation brake is the S-cam drum brake, the other braking system used are disc brakes.

Describe disc brakes:

- Disc brakes use a floating caliper.
- Like drum brakes, they are available with and without spring brake chambers.
- The disc brake works on the same principles as the drum converting air pressure to braking force.
- Pressure from the foot valve operates the brake chamber in the same way.
- The pushrod exerts pressure onto the lever.
- The connected actuating overcomes the return springs.
- The force then passes through two rods and tappets to the brake pads, clamping onto the disc.

Ask: What are some differences between the S-cam type and the disc type (no push rod visible, no slack adjuster)

Video – Operation of an air brakes system

Show this video to help explain the previous slides.

Commercial vehicle air brakes: https://youtu.be/OZ6l9J6NK5s (3.02)

This court animation depicts the components and operation of a commercial vehicle air brake system. This video, along with the live narration, provides an easy to understand portrayal. For more information visit www.wolftechnical.com. Copyright 2016 Wolf Technical Services, Inc.

Compressor

Slides 28-30 - Compressor

- An air brake system requires a way to compress air and store it in reservoirs
- Compressor takes air from the atmosphere and compresses (pressurizes) it **and pumps it** through an air line to a supply reservoir
- As long as the engine is running the air compressor is producing air
- The air that leaves the compressor is hot (204°C or 400°F) and will form condensation when it reaches the cold reservoirs.

Checking the compressor during the pre-trip

- Checking the security (attachment) and operation of the compressor is part of an air pre-trip.
- It must build air pressure from 50-90 psi in three minutes or less at a fast idle. If it doesn't, have the compressor checked by a mechanic.
- Ask: What are two different measurements used for pressure? (Pounds per square inch - psi or kilopascals - kPa

Compressor needs a clean air supply

- The compressor needs a supply of clean air to work properly.
- The air from the atmosphere supplies both the truck engine and the compressor.
- A piston-type compressor operates on a similar principle to that of the intake and compression strokes of a typical car engine.

How are compressors cooled?

- The most common method on heavy trucks is to circulate engine coolant through the compressor.
- Oil lubricates the moving parts of the compressor, similar to oil lubricating the moving parts of a car's engine.
- Oil helps to cool the compressor and is usually supplied by the same oil as the engine.
- It's important to ensure there is sufficient oil supply.

Ask: How many minutes must the compressor be able to build air pressure from 50-90 psi at a fast idle? (3 minutes).

Governor

Slide 31-32 - Governor

- As the compressor is always producing air if the engine is running. There needs to be a way to control where the air goes - this is the job of the governor
- When enough pressure has been built up, the governor causes the compressor to go into the "unloading" stage
- Governor has two stages: loading and unloading
- Governor has a pre-set to cut out between 105 and 135 where the compressor goes into unload stage
- During unload stage air from the compressor is return to the atmosphere
- 20 psi below maximum pressure, the governor goes into the loading stage sending air from the compressor to the reservoirs.

Checking the governor

- As part of the pre-trip, you'll lower the air pressure by applying and releasing the brakes several times and check that the governor puts the compressor into the loading stage by 80 psi.
- Then, once pressure builds to maximum in the air tanks, you'll check that the governor "unloads" any additional air pressure produced by the compressor. You can hear the air release and see on the gauges that pressure is no longer building.

Air reservoirs

Slide 33-34 – Air reservoirs

- Reservoirs are steel or aluminum tanks used to store the compressed air produced by the compressor
- A safety valve on the first reservoir protects the reservoirs from being over-pressurized and bursting, if the governor fails to unload the compressor
- Safety valves are set to release air from the reservoir at 150 PSI in the event of the governor fails to go into the unloading stage

Drain cocks or valves

- Sludge, a combination of water and oil from the compressor, will make its way to the reservoirs.
- To prevent sludge from contaminating the air valves in the system, drain valves (drain cocks) are installed in all reservoirs.
- Most manufacturers recommend that you drain reservoirs daily.
- When draining reservoirs, allow time for the air to completely drain.
- If the truck has a wet tank, it should be drained daily, as well as the primary and secondary.
- Not all vehicles have wet tanks, many have an **air dryer integrated system - ADIS**.
- You can tell it is an ADIS system if the governor is mounted to a small pancake like air tank with the air dryer. More on air dryers later.

Foot valve

Slides 35-38 - Foot valve

- The brake pedal referred to as a foot valve works much like the one in a car but it feels quite different when pushed on
- When the foot valve is pushed the air is sent through air lines to the brake chambers at each wheel and pressurizes the service side of the brake chamber
- When the foot valve is released the air expels to the atmosphere
- The maximum air pressure that the foot valve can deliver to the service brakes is whatever pressure is in the reservoir
- The unique feature is that you can hold the same pressure at the brakes, even if there is a small air leak downstream from the foot valve.

Introduce the leak test

- As part of the pre-trip you'll test the system for leaks using a full brake application.
- The system cannot lose more than three psi in one minute.
- Ask: Why would we want the engine off? (So you can listen for leaks.)

Dual air system

Slides 39-40 - Dual air system

- Like most cars the air system is a dual system, one half controls the front brakes the other that controls the rear brakes with a single foot valve
- In air brake equipped vehicles we have the primary air system which controls the rear brakes and the secondary air system which controls the front brakes
- By using two-way check valves if there is a failure in one side of the system although they will not have full braking power they will be able to come to a controlled stop.

Slide 39

- A dual air brake system will prevent total brake failure if there is a problem with one of the systems.
- Most dual systems use three reservoirs to hold air with air gauges on the primary and secondary reservoirs.
- Explain that the primary in most systems controls the rear brakes on the vehicle and the secondary control the front brakes.

Slide 40

- Explain that the primary and the secondary tanks are filled though one way check valves. If one side of the systems fails, the driver will not have full braking power but they will still be able to have a controlled stop.
- Note the change in terminology for the reservoirs. The first reservoir (wet tank) is called the **supply reservoir**. The two service reservoirs are called the **primary reservoir** and **secondary reservoir**, indicating the section of the dual foot valve that they supply.
- The supply tank feeds the primary and secondary tanks.
- Explain that a one-way check valve protects from air loss if the discharge line from the compressor was to break.

Gauges and warning devices

Slide 41 - Reservoir pressure gauges

- Primary and second reservoirs will have a gauge to show the pressure in the reservoir
- They may have one gauge with two needle or two gauges

Discuss the operating pressures.

- The governor should maintain the pressure in the reservoirs between 105 and 135 psi. The governor should return to the reload stage 20 psi below maximum and must start to reload by 80 psi.
- If the governor does not start to reload by 80 the vehicle is out of service and should not be operated.
- Discuss the compressor test of 50 psi to 90 psi in under three minutes, the time starts when the first needle goes through 50 and the timer stops when the last needle goes through 90 psi.

Slides 42-43 - Low air warning

- All air brake equipped vehicles must have a low air warning device
- It must activate by 60 psi
- Must have a visual warning indicator, however most also have an audible alarm
- If a low air warning comes on when driving the vehicle needs to be stopped immediately and the problem resolved before continuing.

- Checking the low-air warning device during the pre-trip
- Ask: How could we test the low air warning device during a pre-trip?
- Answer – by intentionally lowering the air in the system. This is done by pressing and releasing the foot valve (fanning down) until the low air light and alarm (if equipped) comes on. It must activate by 60 psi or above.
- This is done with the parking brakes released.
- If the warning device fails to operate correctly, the vehicle cannot be driven until it is repaired
- The warning device must have a light. Ask: Why do you think a light is needed? (A hearing impaired person may operator an air brake equipped vehicle)

- Explain about wig-wags on older vehicles.

Spring brakes

Slides 44-46 - Parking brake spring brakes

- While air pressure does an excellent job to help stop a vehicle by applying the foundation brakes, it is unreliable (and illegal) for use for parking.
- If you park a vehicle using only the air, any leaks in the system, or any failure in a hose, diaphragm, or air valve would result in loss of air pressure and a possible rollaway collision.
- Regulations for parking brakes require that the parking force must be maintained by mechanical means and be unaffected by loss of air pressure.
- Spring brakes have a large spring that is mounted inside a chamber attached to the service chamber.
- It uses air pressure to hold the spring off to release the parking brakes and the mechanical force of the spring to apply the parking brakes.
- Ask students why spring brakes are not placed on the steering axle?
- Answer – In an emergency, the spring brakes may apply and they would lock up the wheels on the steering axle and possibility cause the driver to lose control.

Slide 46

- Ask - If the brakes are out of adjustment how will it affect the parking brakes?
- Show them on the diagram that the parking brakes use the same pushrod to apply the brakes so if the brakes are out of adjustment the parking brake will be less effective.

Slide 47 - Applying and releasing spring parking brakes

- Spring brakes are normally released by suppling air to compress the large spring by a dash mounted valve
- If air pressure falls below 60 PSI the spring brakes will start to apply (drag).
- The spring brakes may apply fully when air falls below 60 PSI.
- Air pressure is used to hold the spring brakes released.
- Explain that air supplied to the parking control valve is from both primary and secondary air. This is referred to as blended air.
- One other way to release the spring brakes is to manually cage or wind off the spring brake by using a caging bolt. Important - if this is being done, block the wheels to prevent the vehicle from rolling away.

Slide 48 - Parking control valve

- Parking control valve is usually a push pull yellow button on the dash – some older vehicles will have a switch
- Pushing the button supplies air to compress the spring brakes
- Pulling the button release the air allowing the large spring to expand applying the parking brake
- A less common is a lever flipping one way releases the spring brakes and the other direction applies the spring brakes. The lever doesn't move even if the air is completely exhausted.
- Explain that the yellow button is in the released position and it may pop out on its own if the air pressure is lower below 50 PSI but is not required to

Slide 49 - Driver alert - compounding of brakes

- Compounding of brakes is two forces doing the same thing
- The parking brake system uses the same braking system as the service brakes
- If the parking brake is applied and a heavy brake application is made using the foot valve, we have two forces doing the same thing
- This is known as compounding the brakes and may cause damage to the foundation brakes
- It should be noted that a light brake application under 40 PSI will not hurt the foundation brakes.

Slide 50 - Spring brakes in a dual air brake system

- Air to the dash control valve is supply through a two-way check valve
- The two-way check valve uses both primary and secondary reservoirs to supply the parking brake dash control
- The air that is delivered from the two-way check valve is frequently called blended air.

Slide 51 - Two-way check valve

- Have two inlet ports and one delivery port
- Has a free-floating shuttle between the two inlet ports
- The inlet port with the highest pressure will supply the delivery port
- The free-floating shuttle will move inside the valve to allow this to happen closing the inlet port with the lower pressure
- This ensures if air pressure in one system is lost the other side will continue to work and the spring brakes will not automatically apply.

Slide 52 - Spring brakes – when air is lost from one circuit

- If air is lost from the primary circuit the air in the other circuit will allow the vehicle to be stopped
- Some vehicles have a spring brake modulator valve. This valve allows air to escape using the spring brakes to aid in stopping
- Spring parking brakes don't apply automatically in a dual air system when air is lost from one circuit
- The low-air warning system alerts you to the air loss, allowing you to make a controlled stop using the front axle brakes
- Some vehicles with dual air systems have an optional device called a **spring brake modulator**
- The spring brake modulator senses a loss of pressure in the primary system, and when the service brakes are applied, causes air to be exhausted from the spring parking brakes in direct proportion to the brake application
- When applying the foot valve normally, you can control the amount of spring force used to assist the front brakes to bring the vehicle to a controlled stop
- Explain that the air used to hold off the spring brakes is released in direct proportion to the foot valve application
- It should be noted that you will not have many applications before the spring brakes apply and you will not be able to move the vehicle.

Other types of foundation brakes

Time required approximately: 15 minutes

Slides 53-56

Slide 53 - Other foundation brakes

- Discuss where you may find the different types of brakes.
- For example wedge brakes are found on equipment that, due to limited space, you may not be able to use standard type 30 chambers, like a bus.
- Air disc brakes may be found in any application. Air over hydraulic will be more commonly found on lighter units.

Slide 54 - Wedge brakes

- Adjustment and repairs to wedge brakes should only be done by a qualified mechanic.
- Brake shoe can be seen though an inspection hole on the backing plate to check run clearance.

Slide 55 - Air disc brakes

- Disk brakes have no push rod to check.
- There is a mark in the casting on the mounting bracket and the caliper if they are aligned the pads need to be replaces.
- With the wheel installed a mirror may have to be used to see these marks.
- Make sure adjustment and repairs to air disc brakes are only done by a qualified mechanic.

Video - Air disc brake inspection

https://www.youtube.com/watch?v=wLMY5FB1POY (2.10)

Garage Gurus, Feb. 2, 2018

Description: Ensure that the brakes on your heavy duty vehicle are road ready with periodic inspections. In this video, Master Technician Ken Boyer of Garage Gurus shows you what to look for when performing an air disc brake inspection.

Slide 56 - Air over hydraulic

- Once again, no push rod to check travel.
- Run clearance like the wedge brake is checked through an inspection hole on the backing plate.
- Adjustment is completed by a technician.
- Discuss similarities of air over hydraulic and a braking system in their car. Brake fluid needs to be checked.

Other air brake system components

Time required: 15 minutes

Slides 57-60

Slide 57 - Air dryers

- Air dryers are optional devices installed in the compressor discharge line between the compressor and the first reservoir.
- Designed to remove any water vapour, oil mist and carbon particles from the air before it's delivered to the first reservoir.
- Even if the air brake system includes an air dryer, air reservoirs should still be drained daily to check for contaminants.

Slide 58 - Air dryer integrated system (ADIS)

- Common with most newer vehicles
- Can be identify by the air dryer being mounted to a pancake style tank
- Note that on some air dryer integrated systems the air pressure will build to 100 PSI in one reservoir before the other reservoir will begin to build.

Slide 59 - Alcohol evaporators and alcohol injectors

- Alcohol evaporators and alcohol injectors are optional devices that introduce a small amount of alcohol vapour into the air system. The alcohol vapour combines with any moisture that may be present. In effect, the alcohol acts as an anti-freeze, lowering the freezing point of any moisture that's collected in the air system
- These systems are designed to use pure methyl hydrate to provide the alcohol. Be sure to use only methyl hydrate specifically formulated for use in alcohol evaporators or alcohol injectors
- May be on older vehicles.

Slide 60 - Front wheel limiting valve

- Automatic front wheel limiting wheel valve has no driver input
- Manual allows driver to engage on slippery roads reducing air pressure to the front wheels
- Vehicles manufactured after April 2000 will have ABS.

Components review

Time required approximately: 20 - 30 minutes.

Have students do the matching activity then review the components with probing questions.

Activity – Matching air brakes components

Give students a few minutes to individually complete the matching air brakes components activity in their workbook. Once everyone is ready, review the answers.

Brake adjustment

Time required: 60 minutes

Slides 61-65

Explain that you are going to discuss the importance of proper brake adjustment and how to adjust manual slack adjusters.

Slide 61 - Brake adjustment

- Driver is required to check brake adjustment daily
- Slack adjustment is keeping the distance between the brake shoes and the drum within tolerance
- Pushrod travel is the distance the pushrod travels when it extends from the brake chamber
- Type 30 regular stroke chambers will have 2 ½ maximum stroke
- Type 30 long stoke chambers will have 3 inches of maximum stroke
- Explain that if one brake is out of adjustment the other will have to work harder and could possibility cause the other brakes to heat up.

Slide 62 - Brake adjustment continued

- Overheating of the brakes may occur if the brakes are out of adjustment or have worn parts
- Brake fade occurs when the brake drum heats and expands away from the brake shoes requiring more application pressure to maintain the same amount of braking
- Bottoming out occurs when the pushrod is extending to the point where the plate on the end of the pushrod inside the brake chamber is hitting the bottom of the brake chamber. At this point there is no more stroke available and if you haven't stopped you may not be able to stop and now have a runaway.

Slide 63 – Checking brake adjustment

- Review the steps to check brake adjustment.
- Confirm the air is over 100 PSI the wheels are chocked, and the brakes released
- If using the pry bar method, you'll need a bar and you will use the bar to extend the pushrod
- The travel should not exceed ½ to ¾ of an inch. The travel should be the same of each side of the axle
- Adjust as required
- If using the applied stoke method, you'll need two people or a way to hold a brake application
- Make and hold a brake application
- Check pushrod travel it should be 1 ½ to 1 ¾ on each wheel
- Confirm the travel is the same at both wheels on the axle
- Adjust as required.
- It should be noted that automatic slack adjuster may extended to 2 inches
- Some air brake chambers will have a red band on the pushrod. If this red band is visible the brake is out of adjustment.

Slide 64 - Adjusting a manual slack adjustor

- Check the brake adjust with one of the methods
- Note the direction the end of the S-cam rotates when being applied
- If brakes require adjustment push in the locking collar and turn the nut so the S-cam rotates the same direction it did when being applied
- Tighten until there is resistance
- Confirm there is no travel on the push rod
- Back the nut off 1/3 of a turn (i.e. 20 minutes on a clock face)
- Confirm there is between ½ and ¾ inch of travel
- Confirm that the locking collar has come back out over the nut.

Slide 65 - Automatic slack adjustors

- Discuss the different types of automatic slack adjustors
- If an automatic slack adjustor requires adjustment, refer to adjuster manual – these can be downloaded from the manufacturer's website
- If an auto slack needs adjustment, have it checked at a shop as soon as possible. It needs replacing
- Optional - if the instructor knows how to adjust the different types time permitting go over how to adjust them.

Activity – manual slack adjustment

If you have a brake assembly available, demonstrate a manual slack adjustment and have each student practice.

Alternately you could take the class out to a truck and demonstrate measuring the slack adjustment using the pry bar and applied stroke method.

Air brake pre-trip inspection

Time required: 60 minutes

Slides 66-77

Explain that you are going to review the entire air brake pre-trip inspection. Students can follow along with their handout. Use questions to see what students remember from previous discussion. Then students will do a fun activity to see what they remember. Consider also showing an appropriate video or doing a live demonstration on an air board or vehicle.

Slide 66 - Air brake pre trip – getting started

- Make sure you are safe and seen
- Block the wheels and place transmission in low gear.

Slide 67 - Air brake pre trip - reservoirs

- Check to confirm there is some air on the gauges
- Locate and drain the supply tank (wet tank)
- Note some newer vehicles may not have a supply tank ADIS System
- Check to confirm there is air in the reservoirs once the wet tank is drained. This will confirm the one-way check valve is operational.

Slide 68 - Air brake pre trip - foundation brakes

- Open hood and check slack adjustor travel
- Check the airline going into the brake chamber for any damage
- Check the brake chamber is in good condition and is firmly mounted
- Explain that there should be a check of the complete foundation brakes
- Ask students if they can list the foundation brake components
- Repeat this on the other side.

Slide 69 - Air brake pre trip compressor

- Check the compressor is secure and the discharge line (the main airline coming off the compressor) is in good condition
- Check other airlines under the hood to confirm they are in good condition and secured
- If equipped with a belt driven compressor, check the condition and tension of the belt.
- Check that there are not coolant or oil leaks.

Slide 70 - Air brake pre trip in cab

- Re-enter the cab confirm the vehicle is in neutral and start the vehicle
- Release the brakes by pushing in the yellow parking brake control valve.

Slide 71 - Air brake pre trip - governor operation

- Press and release the brake pedal – called fanning down - to lower the air no lower than 80 PSI. Allow the compressor to build to maximum air pressure to between 105 and 135 PSI
- Next, lower the air by 20 PSI to confirm the governor puts the compressor into the reload stage, this will be determined when the needles begin to climb. Continue to fan down to check that the low air warning comes on by 60 PSI
- Continue to lower the air pressure until both needles are below 50
- Then, check the compressor. When the first needle hits 50 PSI start timing the compressor must build from 50 to 90 PSI in under 3 minutes at an RPM of 1000-1200 RPM. Stop the timing when the last needle goes through 90 PSI
- Confirm the parking brakes remained released and continue to build to maximum air to confirm that the governor puts the compressor into the unload stage (somewhere between 105 and 135 PSI).

Slides 72 - Air brake pre trip - leak test

- With the brakes released, the engine off and the window open to hear any audible air leaks, make a firm brake application
- To perform a leak test, hold a firm brake application for 1 minute, you cannot lose any more than 3 PSI during that time
- Once completed, confirm there is a minimum of 100 psi in your reservoirs, confirm the brakes remained released and put the vehicle in low gear, taking the keys, and exit the vehicle.

Slide 73 - Air brake pre trip - under vehicle

- Go under the rear of the vehicle to check the air tanks to confirm they are secure; the airlines are tied up and secure
- Then, move back to the rear wheels to perform the same checks as at the front wheels.

Slide 74 - Air brake pre trip - rear wheels

- Check at each wheel that the airlines going into the brake chambers are in good condition, the brake chambers are in good condition, and that you have the correct travel.
- Use either using the pry bar method or the applied stoke method

Slide 75 - Air brake pre trip – apply the brakes

- Exit from under the vehicle and apply the brakes by pulling the yellow button.

Slide 76 - Air brake pre trip – remove wheel blocks

- Once the brakes are applied remove the wheel blocks
- Discuss the importance of applying the brakes before removing the wheel chocks.

Slide 77 - Air brake pre trip - brake response

- Enter the vehicle and confirm the transmission is in neutral
- Start the vehicle, place in low gear with the parking brakes applied. Try to move the vehicle to confirm the parking brakes are holding the vehicle
- If the vehicle passes this test, release the parking brakes and allow the vehicle to roll ahead
- Using the foot valve make a brake application to confirm the vehicle will stop. This is known as a two-way brake response
- If the student is not licenced to drive the vehicle you are using, they must explain what they would do rather than demonstrating
- It is always the driver's responsibility to ensure the systems is function properly and is safe to operate.

Slide 78 – Recap critical checks

- You must not drive if:
- Pushrod stroke of any brake exceeds the adjustment limit
- Air loss rate exceeds prescribed limit
- Low air warning system fails or system is activated
- Inoperative service or parking brake
- You may be able to drive but get these checked by a mechanic:
- Audible air leak
- Slow air pressure build-up rate.

Activity – Step story

Time required approximately: 20 - 30 minutes

This activity helps students remember procedural steps in a fun and engaging way. It's also very valuable for reinforcing vocabulary associated with air brakes pre-trips.

Print and cut out the individual strips that contain the steps to completing an air brake pre-trip. See the **activity handouts** section.

Have students on their feet in class or outside.

Give one strip, randomly, to each of ten students. Advise them to keep their information private for now. If you have fewer than ten students, give two strips to some students, ensuring you are giving them sequential steps.

Instruct students that they are to put themselves in a semi-circle, in the order that the pre-trip should be conducted. They can discuss it. The instructor stays out of the discussion.

Once they think they're in the correct order, have each student, starting at the beginning, explain what their step is. If someone is out of order, tell them but do not tell them how to correct it – let the students figure it out. Again, start the reading out of the steps until they have it correct.

Ask probing questions to get students to expand as you go.

Air brakes review quiz

Time required approximately: 20 - 30 minutes

Have student complete the short review quiz in their workbook, then review the answers as a class.

Pre-trip test at ICBC

Time required: 15 minutes

Explain what to expect at ICBC for an air brake pre-trip test.

- If your vehicle is equipped with manual slack adjusters, you'll need to perform a brake adjustment as part of the test. Make sure you have the proper tools to carry out this adjustment
- If it has manual slack adjusters, you'll be asked to describe how you would adjust a manual slack adjuster
- During the inspection, explain what you are checking and how you know if each part of the system is working properly.

Trip inspection report

- Handout the ICBC trip inspection report and explain how it is completed.
- Students will get this form to fill out as part of the pre-trip inspection assessment/test.

Practical training for air brakes certification course

In-yard training may be conducted with up to five students per instructor. There is some flexibility allowed when training fewer than five students. Follow the approximate times below.

- Instructor demonstration with discussion: 45 minutes
- Time for hands-on practice (per student): 40 minutes (two air brake pre-trip inspections)
- Formal certification assessments: about 30 minutes per student including the assessment and individual feedback.

In-yard safe teaching guidelines

- Use an area away from other traffic
- If using two vehicles for your group, park the vehicles with the driver doors facing one another with a walkway in between. This will make it easier to keep an on both trucks at the same time
- Chocks the wheels
- Discuss the importance of not starting the engine if another student is under the hood or under the vehicle.
- Confirm that all students understand the starting procedure for the vehicle.
- If the students do not have a learner's licence for the vehicle, they must verbalize the brake response test portion. You may allow students who have a learner's licence to do an actual brake response test, provided an instructor is seated next to them in the cab.

Matching air brakes components - answer key

Match the definition for each of the following components. Write the definition number beside the component name.

_7_ Quick release valve

_2_ Safety valve

_11_ Governor

_1_ Compressor

_10_ Air reservoir

_4_ Pressure gauge

_12_ Drain cocks or valves

_6_ Low pressure warning

_8_ One way check valve

_5_ Air dryer

_3_ Spring brakes

_9_ Parking control valve

1. Squeezes air into a smaller space. This increases the force the air exerts.
2. Keeps the air pressure from rising to a dangerous level in the air tanks.
3. Mechanical brakes used for parking.
4. Tells the amount of pressure in the tanks.
5. Removes water vapour and oil from the air before being delivered to the first air reservoir.
6. Tells the driver the air pressure has dropped below 60 psi.
7. Allows the brakes to release quickly. When you remove your foot from the foot valve, air escapes into the atmosphere.
8. Prevents air from flowing back into the compressor from the reservoirs.
9. A button (usually yellow) on the dashboard used to release and apply the spring brakes.
10. Stores air for use in a brake application.
11. Regulates air flow to maintain the desired air pressure. When the air pressure approaches maximum, the inlet valves open.
12. Found on the underside of air reservoirs to drain the air, moisture, and dirt.

Air brakes basics and single unit review quiz - answer key

1. How many pounds of pushrod force does a type 30 brake chamber produce with 100 pounds of air pressure in the system? (3000 pounds.)

2. Why are air brakes, rather than hydraulic brakes, used on heavy commercial vehicles? (They can apply much greater force.)

3. Why are air brake systems less likely than hydraulic systems to completely fail? (All of the above.)

4. Which of these is not part of an air brake chamber? (Two-way valve.)

5. On a single unit vehicle, the compressor must be able to build pressure in the reservoirs from 50 psi to 90 psi within how many minutes at a fast idle? (3 minutes.)

6. To prevent contamination, how often should reservoirs be drained? (Every day.)

7. The supply reservoir is also known as the (wet tank.)

8. The low-air warning system must activate when pressure in any reservoir falls below (60 psi or 414 kPa).

9. On a dual airbrake system, if the primary system fails, stopping (distance will increase.)

10. The parking brake control valve on the dashboard is usually which colour? (Yellow.)

11. What does compounding the brakes mean? Parking brakes and service brakes applying together.

12. By law, when must you check manual and automatic slack adjusters? (Every day.)

13. Which of these statements is most accurate regarding poorly adjusted brakes? (You may not notice poor adjustment in normal operation.)

14. Where are spring parking brakes mounted on a single unit truck or tractor? (On the rear axles.)

15. If the vehicle's weight and speed are doubled, the stopping power required to stop in the same distance will be (eight times.)

16. Descending a hill will (increase braking distance.)

Air brake pre-trip checklist – single unit

Getting ready - Gather the required tools: wheel chocks, pry bar, timer, flashlight, coveralls or something to lay on when going under the vehicle

- Chock wheels
- Drain supply tank (wet tank), if equipped.

Under the hood checks

- Airline coming out to brake chamber is in good condition
- Brake chamber is in good condition and secure
- Pushrod travel using the pry bar method to confirm travel is within tolerance ½ to ¾
- Repeat the same other the other side
- Compressor is secure and has no major oil leaks and the discharge line is secure and in good condition
- All other air lines are secure and in good condition.

In cab

- Start the vehicle and release the parking brakes by pushing in the parking brake control valve - usually a yellow button
- Lower the air pressure in the reservoirs by pressing and releasing the foot valve (fanning down) until the air pressure is below 100 PSI
- Allow the air pressure to build to maximum (must be from 105 – 135 PSI). You'll know maximum pressure has been reached when you hear a burst of air from the air dryer
- Lower the air pressure by 20 PSI by fanning down. Stop fanning to check if the governor puts the compressor into the reload stage. You should see the air pressure gauge needles begin to climb
- Once confirmed, continue to fan down to confirm that the low air warning activates by 60 PSI
- Once the low air warning has activated, continue to fan down until both primary and secondary air needles are below 50 PSI
- Have a timer ready. Increase engine speed to 1000 to 1200 rpm. Start timing once the first needle reaches 50 PSI and end timing when the last needle reaches 90 PSI. The

compressor must be able to build pressure in under 3 minutes. Note: if you surpass 1200 RPM, you must restart the test

- Check the brakes remain released by pressing on the parking brake control valve (yellow button)
- Build air pressure to maximum - between 105-135 PSI - to confirm the governor puts the compressor into the unloading stage. You will know maximum press has been reached when the air drier releases a burst of air
- Turn off the engine, have your timer ready, open the window to listen for audible air leaks. Make and hold a firm brake application. Start timing once the gauges have stabilized. The air system must not lose more than 3 PSI in 1 minute
- Confirm that there is at least 100 PSI showing on the air pressure gauges.

Brake chambers and slack adjusters

- Exit the cab and go under the rear of the vehicle. Check that the air reservoirs are secure, the air lines leading to the rear axles are in good condition and secure. If the vehicle is a tractor, also check the airlines on the rear of the cab that would attach to a trailer
- Check each wheel as you did on the front axle. Confirm that the airlines going into the chambers are in good condition
- Check the brake chambers are in good condition and secure and that pushrod travel is within tolerance ½ to ¾ of an inch travel
- Once all wheels at the rear of the vehicle have been checked exit from under the vehicle.

Brake response tests

- Enter the vehicle and apply the parking brakes by pulling the parking brake control valve (yellow button). You will hear air exhaust from the brake chambers. Remove the wheel chocks
- Re-enter the vehicle to complete a two-way brake response test. If the student is not licensed for the vehicle, this must be verbalized
- Start the vehicle with the parking brakes applied. Place the vehicle in gear and gently try to move the vehicle. The vehicle should not move
- Release the parking brakes by pushing in the parking control valve (yellow button) on the dash

- Move the vehicle ahead and press on the foot valve to stop the vehicle
- Secure the vehicle by putting it in neutral and applying the parking brakes by pulling the parking brake control valve (yellow button).

Manual slack adjustment - Explain how to adjust a manual slack adjustor:

- Check pushrod travel using a pry bar. Note the direction the S-cam rotated when being applied
- Using a wrench, push down the locking collar and turn the nut so the S-cam rotates in the same direction it did to apply
- Tighten the nut until you feel resistance. Check to confirm using the pry bar method there is no travel on the pushrod
- Using the wrench back off the nut 1/3 of a turn (20 minutes on the face of a clock)
- Confirm the locking collar returns to its original position to cover the nut.
- Recheck the pushrod travel to confirm it is within tolerance ½ to ¾ inch travel.

Pre-trip step story

Print single sided and cut out the individual strips. See instructions.

Getting ready • Gather the required tools • Chock wheels • Drain supply tank (wet tank), if equipped.
Under hood foundation brakes • Airline coming out to brake chamber is in good condition • Brake chamber is in good condition and secure • Pushrod travel using the pry bar method to confirm travel is within tolerance ½ to ¾ • Repeat the same other the other side.
Compressor and air line security • Compressor is secure and has no major oil leaks and the discharge line is secure and in good condition • All other air lines are secure and in good condition.

In cab governor check

- Start the vehicle and release the parking brakes
- Fan down until the air pressure is below 100 psi
- Allow the air pressure to build to maximum pressure between 105 – 135 psi. Listen for burst of air from the air dryer
- Fan down 20 psi. Stop fanning to check if the governor puts the compressor into the reload stage. Look for air pressure gauge needles beginning to climb.

Low air warning

- Continue to fan down to confirm that the low air warning activates by 60 psi
- Once the low air warning has activated, continue to fan down until both primary and secondary air needles are below 50 psi.

Compressor build

- Increase engine speed to 1000 to 1200 rpm. Start timing once the first needle reaches 50 psi and end timing when the last needle reaches 90 psi. The compressor must be able to build pressure in under 3 minutes
- Check the brakes remain released by pushing on the parking brake control valve.

Compressor unload

- Build air pressure to maximum - between 105-135 psi - to confirm the governor puts the compressor into the unloading stage. Listen for a burst of air from the air dryer.

In cab leak test

- Turn off the engine, have your timer ready, open the window to listen for audible air leaks. Hold a firm brake application. Start timing once the gauges have stabilized. The air system must not lose more than 3 psi in 1 minute
- Confirm that there is at least 100 psi showing on the air pressure gauges.

Under vehicle and rear wheels

- Check that the air reservoirs are secure, the air lines leading to the rear axles are in good condition and secure
- Check the brake chambers are in good condition and secure and that pushrod travel is within tolerance ½ to ¾ of an inch travel.

Brake response tests

- Apply the parking brakes. Remove the wheel chocks
- Start the vehicle. Place the vehicle in gear and gently try to move the vehicle. It should not move
- Release the parking brakes. Move the vehicle ahead and press on the foot valve to stop.

Air brakes for trailers

Unit overview

This unit on air brakes for trailers is applicable to all types of air brakes equipped vehicles that tow trailers.

Minimum required time: 2 hours in the classroom

This lesson could be combined with vehicle inspections theory.

Materials required

- Audio/visual equipment
- Whiteboard or flipchart and markers
- Slide presentation.

Optional materials

- Model foundation brake assembly
- Air brakes board
- Air brakes components
- Simulation program such as *Air Brakes Interactive*.

Videos

Trailer Parking Brake (1:37)
https://www.youtube.com/watch?v=1ze6oceDPr0

An animation showing the workings of a trailer/s air driven parking brake system. Fanshawe Motive Power

Automatic inflation systems for tires and suspension

Trailer Air System, Jim Gibson - YouTube (5:42)

Discusses auto inflation system for tires and suspension (2019).

Learning outcomes from the MELT framework

The following learning outcomes from the MELT curriculum framework are covered in this air brakes for trailers unit.

10.2. Conduct pre-trip and en route air brake inspections and identify any minor or major defects

10.2.22. Checks glad hand security and connection.

10.2.23. Tests the tractor protection valve.

10.2.24. Tests function of service brakes on the trailer (hand valve).

10.2.25. Tests automatic application of the trailer spring (parking/emergency) brakes.

Introduction

Slide 1 – Intro to air brakes for combination units

Provide a brief overview of the unit:

- Air brakes combination units
- Valves added for trailer use
- Dual air systems
- Air valves working together
- Bobtailing
- Air line coupling
- Trailer spring brakes
- ABS on trailer
- Combination unit air brake pre trip

Air brakes components- combination unit

Slide 2 - Air brakes valves for combination units

Explain the valves that are added to a truck to make it a tractor

- Explain the reason we use glad hands to attach the air lines to the trailer
- Review different types of glad hands - rubbers in the glad hands can be replaced.
- **Tractor protection valve** controls the air to the trailer. This allows us to drive the tractor without the trailer attached.
- **Trailer supply valve** sends air to the tractor protection valve to allow air flow to the trailer.
- **Tractor protection valve**, during a pre-trip, must close or stop the air flow to the trailer between 45-20 psi.

- The **hand valve** controls the service brakes of the trailer only, independently of the foot valve and should not be used as a parking device.

Slide 3 - Air brake components added

- Go over the components added and the location
- Talk about the additional two-way check valve and the purpose.
- In most dual systems, the parking brake control valve (yellow button) is interlocked with the trailer supply valve (red button) so that applying the parking brake control valve causes all the parking brakes on both the tractor and trailer to apply.

Slide 4 - Failure in primary system

- Low-air warning device would have went off
- When foot application is made, the two way valve takes air from highest pressure to apply the brakes
- In this case primary failure tractor front brakes and trailer service brakes are applied.
- Because the trailer supply valve is now supplied with "blended air" from a two-way check valve, the automatic shutoff will not occur until the service reservoir with the highest pressure is lowered to between 20 and 45 psi (138 and 310 kPa).
- The automatic shutoff requirement should be checked as part of a pre-trip inspection. If it doesn't function properly, the vehicle must be placed out of service until it is repaired.

Slide 5 - Air brake valves working together

- The tractor protection and the trailer control have working together protects the tractor air supply from depleting to an unsafe level in the event of separation
- Air supply valve shut off automatically
- There is no pressure in the supply line to the trailer, the tractor protection valve has closed the passage to the trailer control line. No application air can be wasted through that broken line.
- If the control line separates, nothing will happen until the trailer brakes are applied – then the tractor protection system will activate to protect the tractor air supply.
- When a trailer is not connected, the trailer air supply valve will be in the closed position. This allows the tractor to be driven bobtail so that no air will be lost through the disconnected glad hand couplers.

Slide 6 - Bobtailing

- Driving a tractor without a trailer attached is called bobtailing
- Some tractors are equipped with a bobtail proportioning system.
- When the tractor is being driven with a trailer attached, the tractor brakes operate normally. But when bobtailing, the braking pressure to the drive axle brakes is reduced by as much as 75 per cent, preventing the rear brakes from locking.
- The steering axle brakes receive full application pressure
- A tractor with a bobtail proportioning system will stop in a shorter distance and control will be increased, especially on wet or slippery road surfaces
- Because the steering axle brakes are doing most of the braking, a higher than normal pedal pressure is required

Slides 7 – 8 - Trailer system components

A trailer system has many of the components found on a truck system:

- foundation brakes
- air chambers
- air reservoirs and
- control valves.

The trailer system must rely on the tractor for two important needs:

- First, the trailer must receive the compressed air from the tractor to fill the trailer reservoirs
- Second, the trailer system must receive the commands from the tractor about when to apply and release the brakes

To fulfill these needs, there are two air line connections between the tractor and the trailer air systems.

The airline that supplies the trailer reservoirs with air at full tractor reservoir pressure is called the supply line, or sometimes called the emergency line.

The line that carries the control signal from the tractor is called the control line or commonly called the service line.

Trailer air brakes system

Slide 9 - Trailer air system

- There are two basic types of trailer air systems
- Explain to the class that a dolly or convertor is considered a trailer.
- Those that use spring parking brakes
- Those that use a series of valves and air for the parking brake circuit
- All trailer systems must have an emergency stopping system that will fully apply the trailer brakes if the trailer separates from the tractor.

Slide 10 - Trailer with spring parking brakes-charging

- The system shown uses one reservoir and two air valves, a relay valve for the service brakes
- A trailer spring brake valve that fills the reservoir and controls the spring parking brakes.

Slide 11 - Air brakes trailer spring brake valves

- Two types of systems are
- One fills the reservoir(s) before releasing the spring parking brakes
- The other releases the spring parking brakes first, then fills the reservoir(s)
- Introduce the four-way brake response
- Ask the students if they recall the two-way brake response from the single unit lesson
- With the trailer we will need to add two more checks - the tug test to the trailer spring brakes and checking that the service brakes work on the trailer.

Slide 12 - Trailer with spring brakes - service brake application

- Relay supplies air from reservoirs to service brakes
- Chamber pressure approximately the same as control signal
- Explain to the students that the air delivered to the control line is the greater air pressure. This means that if a 10psi application is delivered by the foot valve and a 15 psi is delivered by a hand valve application the hand valve application will be the higher and the pressure delivered to the trailer will be the hand valve pressure.

Slide 13 - Trailer with spring brakes dynamited

- Senses air loss in supply and applies spring brakes
- Air exhaust from trailer spring brake valve
- This is referred to dynamiting the trailer brakes
- Trailer brakes dynamite or apply when trailer lines are disconnected, or trailer valve is closed
- Ask the class if this happens what other have should activate?
- The tractor protection valve will activate this must happen by 45-20 psi but may happen at a higher pressure. This is to prevent total air loss to the tractor.

Slide 14 - Braking combination units

- Foot application delivers same service pressure to tractor and trailer
- If hand valve is used at a higher application then the foot valve the service brakes on the trailer will be greater than the tractor.

Slide 15 - Trailer ABS air brake systems

- Trailer ABS systems use similar components as those on trucks and tractors
- The ECU may be powered from the stop lamp circuit or may have a dedicated power source through the electrical connector.
- Trailers with ABS air brakes will also have an indicator visible in the tractor's mirror to indicate if the system's not functioning properly.
- This warning light may be mounted on the front left side of the trailer or on the rear left side of the trailer.
- On some air brake systems, there may be a trailer ABS warning indicator on the dashboard of the tractor.
- A non-ABS tractor may tow an ABS equipment trailer however it is to be understood that the ABS on the trailer will not function which may increase stopping distances.

Combination unit air brake pre-trip

Slide 16 - Combination unit air pre trip

- Go over the steps to perform a pre-trip on a tractor trailer unit.
- Point out that some of the information is the same as the single unit.
- Students will be completing a pre-trip inspection regularly throughout their training

Slide 17 - Getting started

- Make sure you are safe and seen
- Block the wheels and place transmission in low gear.

Slide 18 - Reservoirs

- Check to confirm there is some air on the gauges
- Locate and drain the supply tank (wet tank)
- Note some newer vehicles may not have a supply tank ADIS System
- Check to confirm there is air in the reservoirs once the wet tank is drained. This will confirm the one-way check valve is operational

Slide 19 – Under the hood - foundation brakes

- Open hood and check slack adjustor travel
- Check the airline going into the brake chamber for any damage
- Check the brake chamber is in good condition and is firmly mounted
- Repeat this on the other side.

Slide 20 – Under the hood - compressor

- Check the compressor is secure and the discharge line (the main airline coming off the compressor) is in good condition
- Check other airlines under the hood to confirm they are in good condition and secured.

Slide 21 - In cab

- Re-enter the cab confirm the vehicle is in neutral and start the vehicle
- Release the brakes by pushing the dash control valves in.

Slide 22 – In cab - check governor operation

- Press and release the brake pedal to lower the air no lower than 80PSI.
- Allow the compressor to build to maximum air pressure between 105-135.
- Next, lower the air 20 PSI to confirm the governor puts the compressor into the reload stage, this will be determined when the needles begin to climb.
- Lower the air pressure by pressing and releasing the brake pedal to check the low air warning it must come on by 60 PSI.
- Continue to lower the air pressure until the trailer supply valve closes. This must happen between 45-20 PSI.
- Exit the cab using three-point contact to confirm the trailer parking brake circuit has engaged.

Slide 23 - Check parking brake on trailer is engaged

- Walk to the rear of the trailer have the student do a visual that the push rods have extended engaging the parking brake circuit.

Slide 24 – Disconnect air lines

- Return to the front of the trailer and disconnect the air lines.

Slide 25 - Check tractor protection valve

- Once the air lines are disconnected you will need to make a brake application to confirm that the tractor protection valve is working. This will be confirmed if there is no air escaping the air lines while the brake pedal is being held
- This application can be made by reaching into the cab and using your hand on the brake pedal. This is a light brake application so as to not compound the brakes on the tractor. Once this test is completed and the tractor has passes reconnect the air lines.
- Reattach the airlines to the trailer.

Slide 26 – Continue compressor check

- Re-enter the cab to complete the compressor check.
- Start the engine and have a timer ready
- When the first needle hits 50 PSI start timing the compressor must build from 50 to 90 PSI in under 3 minutes at an RPM of 1000-1200 RPM. Stop the timing when the last needle goes through 90PSI.
- Release the parking brakes on the truck and trailer by pressing the dash control valves and continue to build to maximum air to confirm that the governor puts the compressor into the unload stage between 105 and 135.
- When building air from 50-90 the RPM may not exceed 1200RPM if it does this part of the test must be redone by lowering both needles below 50 and starting again.

Slides 27 - 28 - Leak test

- With the brakes released, the engine off and the window open to hear any audible air leaks, make a firm brake application.
- Have a timer ready
- To perform a leak test, hold a firm brake application for 1 minute, you cannot lose any more than 4 PSI during that time with one trailer and 6 PSI if you had two trailers.
- Listen out the window for any audible air leaks.
- Once completed, confirm there is a minimum of 100 psi in your reservoirs, confirm the brakes remained released and put the vehicle in low gear and exit the vehicle.

Slide 29 - Under tractor

- Go under the rear of the vehicle to check the air tanks to confirm they are secure; the airlines are tied up and secure.
- Then, move back to the rear wheels to perform the same checks as at the front wheels while checking that the airlines are secured along the frame.

Slide 30 – Check air lines and pushrods

- Check at each wheel that the airlines going into the brake chambers are in good condition, the brake chambers are in good condition, and that you have the correct travel. Either using the pry bar method or the applied stoke method.

Slide 31 – Apply the parking brakes

- Exit from under the vehicle and apply the brakes by pulling the yellow button.
- Explain that the red trailer supply will usually pop at the same time.

Slide 32 - Remove wheel blocks

- Once the brakes are applied remove the wheel blocks.
- Cover the importance of applying the brakes before removing the wheel chocks.

Slide 33 – Four-way brake response test

- Enter the vehicle and confirm the transmission is in neutral.
- Start the vehicle, place in low gear with the tractor control valve (yellow button) applied and the trailer control valve released (red button). Try to move the vehicle to confirm the tractor parking brakes are holding the vehicle.
- If the vehicle passes this test, release the tractor control valve (yellow button) and apply the trailer control valve (re button). Try to move the vehicle to confirm the parking brakes are holding on the trailer.
- If the vehicle passes the above test, release the control valves on the tractor and trailer and allow the vehicle to roll ahead.
- Using the foot valve make a brake application to confirm the vehicle will stop. This is confirming the service brakes.
- If it stops, again, allow the vehicle to roll ahead.
- Using the hand valve (if equipped) apply the service brakes on the trailer to confirm the vehicle stops.
- This is known as a four-way brake response.

Air brakes for trailers review quiz

Time required approximately: 15 minutes

Have student complete the review quiz to test their knowledge. Then review the answers as a class.

Air brakes for trailers review quiz - answer key

1. What components are added to a truck to create a tractor?

   a) One way check valve, secondary air gauge, tractor protection valve
   b) Tractor protection valve, trailer control valve, application gauge
   c) Air lines with glad hands, trailer control valve, tractor protection valve
   d) Hand valve, tractor protection valve, airlines with glad hands

2. In the event of a failure in the secondary system on the tractor, which brakes will not function?

   a) The spring brakes on the trailer
   b) The service brakes on the trailer
   c) The spring brakes on the tractor
   d) The service brakes on the tractor front axles

3. What valve prevents total air loss in the tractor?

   a) Two-way check valve
   b) Tractor control valve
   c) Tractor protection valve
   d) Hand valve

4. What supplies air to the reservoirs on the trailer?

   a) Supply line
   b) Control line
   c) The foot valve
   d) Hand valve

5. At what pressure must the tractor control valve dynamite?

   a**) 20-45 psi**
   b) 50-90 psi
   c) 60 psi
   d) 105-135 psi

6. On a trailer equipped with spring brakes how are the spring brakes released in normal operation?

a) Tractor control valve
b) Tractor protection valve
c) Air pressure
d) Hand valve

7. If the foot valve and hand valve are operated at the same time, the trailer application pressure will be the

a) pressure in the primary reservoir
b) hand valve pressure
c) foot valve pressure
d) greater pressure between the hand valve and the foot valve

8. What will occur if the supply line ruptures?

a) The tractor brakes will apply immediately
b) The trailer brakes will apply immediately
c) The trailer brakes will apply after a foot valve application
d) The relay valve will apply the service brakes

9. When brakes are out of adjustment, the spring brakes

a) are unaffected
b) are more powerful for parking
c) will drag
d) are less powerful for parking

10. When a safety valve actives, this may indicate that the

a) compressor is in the discharge mode
b) governor is defective
c) air dryer has purged
d) spring brakes have applied

11. A quick release valve is sometimes used with spring brakes to allow

a) faster application
b) a more powerful parking brake
c) faster releasing
d) the air to escape for the relay valve

12. On a trailer not equipped with spring brakes, the parking brakes must hold in a full application for a minimum of

a) one minute
b) three minutes
c) four minutes
d) fifteen minutes

13. What will occur if a control line ruptures?

a) The spring brakes will not work on the trailer
b) The service brakes will not work on the trailer
c) There will be rapid air loss in the spring brakes system
d) The tractor service brakes will not work

14. On tractor with a bobtail proportion valve the rear brakes are reduce by what percentage?

a) 20%
b) 25%
c) 50%
d) 75%

15. Glad hands should be properly stored to prevent

a) air loss
b) dirt from entering them
c) the seals from drying up
d) the lines from becoming dirty

16. Which valve applies the service brakes on the trailer only?

a) The relay valve
b) Tractor control valve
c) The hand valve
d) Safety relief valve

17. Fully applying the hand valve with the spring brakes applied will

a) compound the tractor brakes
b) will not compound any brakes
c) compound the truck and trailer brakes
d) compound the trailer brakes

Vehicle inspections and maintenance

Unit overview

This unit introduces students to a systematic approach to inspections, why inspections are important, and how to conduct them safely.

Suggested prerequisite classroom lessons:

- Vehicle components and systems
- Air brakes units.

Total time

Classroom – 3.25 hours including:

- Introduction to vehicle inspections: 60 minutes
- Vehicle detects 30 minutes
- Inspection procedures: 75 minutes
- Later review session: 30 minutes

In yard – 10 hours

- Note: there is an additional 2 hours for in yard air brakes system inspection from the air brakes unit.
- In-yard time includes formal assessments of pre-trip (including air brakes), en route, and post trip inspections.
- Note: some students may require additional practice time to qualify.

Materials required

- Driver vehicle inspection report form and logbook
- MELT Assessment – Vehicle Pre-Trip Inspection (MV7604C)
- Audio/visual equipment
- Slide presentation
- Student workbook.

Learning outcomes from the MELT framework

7.1. Inspect and maintain commercial vehicles

Learning indicators

7.1.1. Explains the need for every workplace to establish a system, and keep a written or electronic record, for periodically inspecting and maintaining vehicles.

7.1.2. Explains their responsibility for the safe condition of each commercial vehicle they operate.

7.1.3. Explains that every commercial vehicle must meet prescribed performance standards while operating on a highway.

7.1.4. Explains that the NSC 13 lists all minor and major defects that the driver is expected to identify.

7.1.5. Explains that the NSC 13 includes the most common defects/unsafe conditions that a driver may encounter.

7.1.6. Explains the importance of enforcement and audit programs to ensure that inspection and maintenance is adequate.

7.1.7. Explains the consequences of vehicle failures due to poor inspections.

Performance standards

7.1.8. Conducts daily inspections of vehicles and operating components and identifies each of the 75 minor and major defects listed in the NSC 13.

7.1.9. Uses personal protective equipment during maintenance and inspection activities.

7.1.10. Confirms that every commercial vehicle being operated displays valid evidence that regulatory periodic inspections and workplace-specific inspections have been conducted.

7.1.11. Inspects the level of operating fluids including fuel, engine oil, engine coolant, power steering oil, windshield washer, diesel exhaust fluid (DEF), etc. - and top up when necessary.

7.1.12. Inspects basic vehicle components, such as drive belts, hoses, tires, switches etc.

7.1.13. Identifies when a minor or major defect listed in the NSC 13 is present on their vehicle.

7.1.14. Completes and signs written or electronic daily inspection reports that declare the vehicle’s condition.

7.1.15. Monitors vehicle condition on a continuous basis, according to the NSC 13 schedule list, while driving or otherwise being responsible for the vehicle, and updates the inspection report as required.

7.1.16. Records on an inspection report every minor defect found during an inspection or while operating a vehicle, and reports the minor defect according to workplace practices, procedures and policies.

7.1.17. Records immediately on an inspection document and report every major defect found during an inspection, or while operating a vehicle, and stops operating the vehicle.

7.1.18. Maintains a vehicle's out-of-service status whenever a major defect is identified, until the condition is corrected.

7.1.19. Conducts regular en route and post-trip vehicle inspections.

7.1.20. Adheres to the regulations whenever accepting an inspection report from another worker.

7.1.21. Carries a valid inspection report for each vehicle operated and a copy of the NSC 13 schedule, and produces these items when required by an enforcement officer.

7.2. Inspect each component or system listed in the NSC 13 for minor and major defects, as required.

Introduction to vehicle inspections

Time required: 60 minutes

Slides 1 - 11

Why conduct vehicle inspections?

Slide 3

- Discuss with the students that wear of vehicle parts is a normal result of vehicle operation – and while a vehicle operates – parts can also become damaged. The amount of wear or damage depends on how much the vehicle is used, and the way it is used.
- Daily vehicle inspection is important in ensuring that problems and defects are detected early before the vehicle is operated on the highway. Inspections prevent the operation of a vehicle with conditions that are likely to cause or contribute to the severity of a collision.
- The trip inspection process is part of a carrier's legal requirement to have and implement a written maintenance program. It also ensures there is clear communication within the company about the vehicle's day-to-day safety.
- Time spent performing vehicle inspection is part of the on-duty time and should reported on the daily log-book as **on-duty not driving**
- Inspection reports serve as communication between drivers, the carrier and the carrier's maintenance department. Reports are used to verify inspections, record defects, report defects and may be used to verify repairs.

Regulations and requirements

Slide 4

Maintenance standards – NSC Standard 11 (Part A)

Slide 5

- The motor carrier has the primary responsibility to ensure all vehicles under its control are systematically inspected, maintained and repaired to B.C. requirements.
- Frequency and what is checked will vary with carrier system and reports provided by the driver.

CVIP inspection – NSC Standard 11 (Part B)

Slide 6

- Requires all commercial trucks, truck-tractors, semi-trailers, trailers and combinations to be inspected at least once a year.
- However, in B.C., *Division 25* of the *Motor Vehicle Act Regulations* (MVAR) is more stringent and requires trucks and trailers to be inspected every **six months** unless the inspection is carried out under an approved **Preventative Maintenance Plan (PMP)** in which case the annually inspection requirement applies.
- Inspections must be conducted by an authorized inspector in a government certified inspection facility.

CVSA/CVSE inspections

Slide 7

- CVSE officers conduct more than 30,000 vehicle inspections each year, issuing violation tickets and removing unsafe vehicles from the provincial roadways on a daily basis.
- Discuss the inspection sweeps conducted by CVSE.
- May 2019 in Delta - 160 unsafe vehicles off the road.
- August 2019, 48 per cent of the commercial vehicles failed in at least one area.

- In 2017, 75 trucks were checked and 40 had to be taken out of service while drivers of the remaining 35 rigs were ticketed for at least one infraction.
- Mechanical deficiencies, load security, bald tires, brakes, windshields, suspension, and steering components were a few of the problem areas.

Discuss - How it is possible that up to 50% of the commercial vehicles randomly inspected did not pass the inspection?

Explain that *Commercial Vehicle Safety Alliance (CVSA)* on-road inspections performed by enforcement officers are identical in both countries.

Driver's daily responsibilities

Slide 8

- Before and after each trip, the driver, or a person specified by the carrier, must ensure that the vehicle is in a safe operating condition.
- The inspection is performed daily before the first trip of the day.
- If the trip lasts more than one day, the inspection is carried out on the second and every subsequent day of the trip no later than the first rest stop of the day.
- A copy of the trip inspection is carried in the vehicle for the day in which it was done.
- En-route (including pre-hill) – to ensure the vehicle remains safe during the trip

Driver's vehicle inspection report

Slide 9

Handout a copy of a driver's vehicle inspection report and review what information must be recorded on it.

Vehicle inspection stations

Slides 10 - 11

Discuss

- Requirement to stop at inspection stations
- What to expect
- Weigh2GoBC program.

Activity - Explore vehicle inspection stations and Weigh2GoBC stations.

https://www2.gov.bc.ca/gov/content/transportation/vehicle-safety-enforcement/services/weigh2gobc-join/weigh2gobc-inspection-stations

Debrief questions - ask the class some debriefing questions to check for understanding before moving on to the next section.

Examples:

- Why are vehicle inspections important?
- When are you required to inspect your vehicle? (Pre-trip, en route, hills, post trip)
- What are the key things to record on the driver's vehicle inspection report?
- How often are commercial vehicles required to have a CVIP inspection in B.C.? (Minimum every six months).

Vehicle defects

Time required: 30 minutes

Slide 12

Introduce the importance of knowing what is consider a major and minor defect then review the chart of defects in the student guide. Provide photos or samples, as appropriate.

Distinguish between minor and major defects. Get students to think about how serious a defect is and what could happen if not corrected.

Tell student that by the end of training, they will need to be able to explain defects that would put the vehicle out of service. This will be learned overtime throughout the course.

Further discuss defects as you review the inspections procedures in the next section.

Homework suggestion

Have student search for images of various vehicle defects to share with the class. You could have them upload the images to a central file location.

In a later review session, look through the images and discuss.

Inspection procedures

Time required: 75 minutes

There are a number of different approaches to teaching vehicle inspections:

- Have student learn about and practice a single unit (Class 3) pre-trip first, then add on the full combination unit pre-trip later.
- Teach the pre-trip in sections. For example, cover under hood items on one day, add on in cab items the next day, and so on. Chunking the information this way can make it easier for students to remember the steps.
- Teach the full pre-trip to start with.

Pre-trip inspection procedure

Slide 13

Driver safety - Ensure that students understand that driver safety must be considered during the inspection procedure, as it may occur in a busy yard, on the roadside and under any type of weather condition.

Explain safety guidelines

- Location and ground surface
- High vis vest or clothing, boots, gloves, eye protection
- Cones, as needed. Where to place these
- Walk facing traffic.

Review the procedures in the student guide or school handouts.

Pre-trip video demonstration

Slide 14

Show this, or other video you prefer, in class and provide the link to students for them to review again at home.

Alternately, just provide the link for at-home study.

Video from *First Class Training Centre - Class 1 Pre-trip inspection training* (24:19)
https://www.youtube.com/watch?v=BxTt1JG4J90

En route inspections

Slide 15

Using the pre-trip inspection as a base, discuss the vehicle systems which required ongoing monitoring while the truck is on the road.

Provide images of a tractor-trailer for students to make annotations.

Brainstorm: When you stop during a trip, what would you want to check?

An en route inspection should include the following:

- All lights are clean and working
- There are no air leaks.
- All the wheels are secure, and tires are properly inflated and are not hot.
- There are no broken or loose items on the vehicle.
- The load/cargo is secure. Load securement must be checked within the first 40km of any trip. After that point, every 240km or three hours, check the load and make a visual inspection of the tractor and trailer
- Coupling devices are secure
- The dangerous goods placards are clean and secure (if applicable).
- The trailer locking mechanisms are secure and in good condition.
- The brakes are properly adjusted.

Explain that the time and location of en route inspections must be noted in the driver's logbook as proof that you have complied with the inspection regulations.

Show an example log that demonstrates the frequency of en route inspections.

Explain safety guidelines

- Make sure the vehicle is completely off the road.
- You should be able to enter and exit a rest or check stop so that you don't have to back up
- Don't make a stop at the bottom of a hill or on an uphill slope.
- The stop area should have an adequate acceleration lane to allow you to merge on to the highway at the appropriate speed.

Pre-hill inspection checks

Slide 16

Pre-hill inspections are a location-specific mandatory en route inspection.

Explain the critical importance of pre-hill checks with B.C.'s mountain roads.

Check that:

- Compressor maintains full reservoir pressure
- No audible air leaks
- Glad hands and air lines are secure
- Brake drums and hubs are not overheated
- Pushrod travel is within limits
- No fluid leaks.

Note: You must check pushrod travel even if your vehicle is equipped with automatic slack adjusters.

Post-trip inspections

Slide 17

Ask the students what regular wear and tear would be expected on a tractor-trailer after a day's work. Create a list of items based on their pre-trip inspection notes.

Key points:

- With the large carriers, the vehicle maintenance often occurs after the driver goes home.
- Record the trip mileage and note any repair issues for the mechanic in process of signing off on the inspection.

Homework

Assign the review quiz as homework and discuss answers in a later review session.

Later review session

Time required: 30 minutes

A week or more after the initial lesson on inspections, and after students have had some practice conducting them, do a thorough review of the inspection information in the classroom.

Vehicle inspection review quiz - answer key

1. Who is required to stop at a vehicle inspection station? (All commercial vehicles over 5,500 kg.)

2. Other than to avoid vehicle breakdowns, explain two other reasons vehicle inspections are important? (To meet legal requirements, to prevent crashes.)

3. Which of the pre-trip, post-trip and en route inspections need to be documented on your log book? (All of them.)

4. For how long is a Schedule 1 valid? (24 hours.)

5. When you start the engine, what gauge do you want to pay attention to first? (Oil pressure.)

6. After the initial pre-trip inspection, how often are you required to inspect your vehicle during a trip? (Within 80 km from point where cargo was loaded and then every three hours or 240 km.)

7. List two key items of personal protective equipment drivers should wear when conducting inspections. (Boots, gloves, eye protection.)

Practical training connection

At the end of the initial classroom session, proceed to the yard for the vehicle inspection activities. You may have up to four students per instructor for these activities.

Demonstrate the pre-trip inspection, then have the students do some initial practice.

Over the course of the training, the student will have a minimum of 10 hours (plus two hours specific to air brakes) to practice pre-trip inspections. Some students may need more practice.

You may wish to allow students to practice pre-trips on their own time if a vehicle is available. Unsupervised students should not be allowed to start or move the vehicle. Unsupervised time doesn't count toward minimum required course time.

In-yard inspection activities

Explain that drivers should never rush through an inspection – for safety reasons and to prevent the vehicle from being declared out of service during a roadside inspection.

Demonstrate the steps in the *Practical lesson plans* or your school's checklist.

- Explain each step of the inspection process, discussing each part/component/system as you are inspecting it.
- Use questions to review content covered in the classroom, discuss problems/defects to look for and the importance of early detection.
- Highlight what would be considered an out-of-service defect if it were present. Students should have a copy of the guide or checklist to follow along.
- After the demonstration have the students, in teams of two, conduct an inspection and complete a Driver's Vehicle Inspection Report (DVIR).
- Allow students to refer to their checklist to start with. Eventually, they must be able to complete the inspection without it.

En route activity

- Demonstrate or talk students through an en route inspection in the yard.
- En route inspections should be reviewed and practiced as part of longer driving days, as required.
- Ask your student: What could change or happen between the pre-trip and post trip inspection?
- Alternately, assign this activity to the practical instructor to be done at an appropriate time and place during practical lessons – such as mountain driving lesson.

Post-trip activity

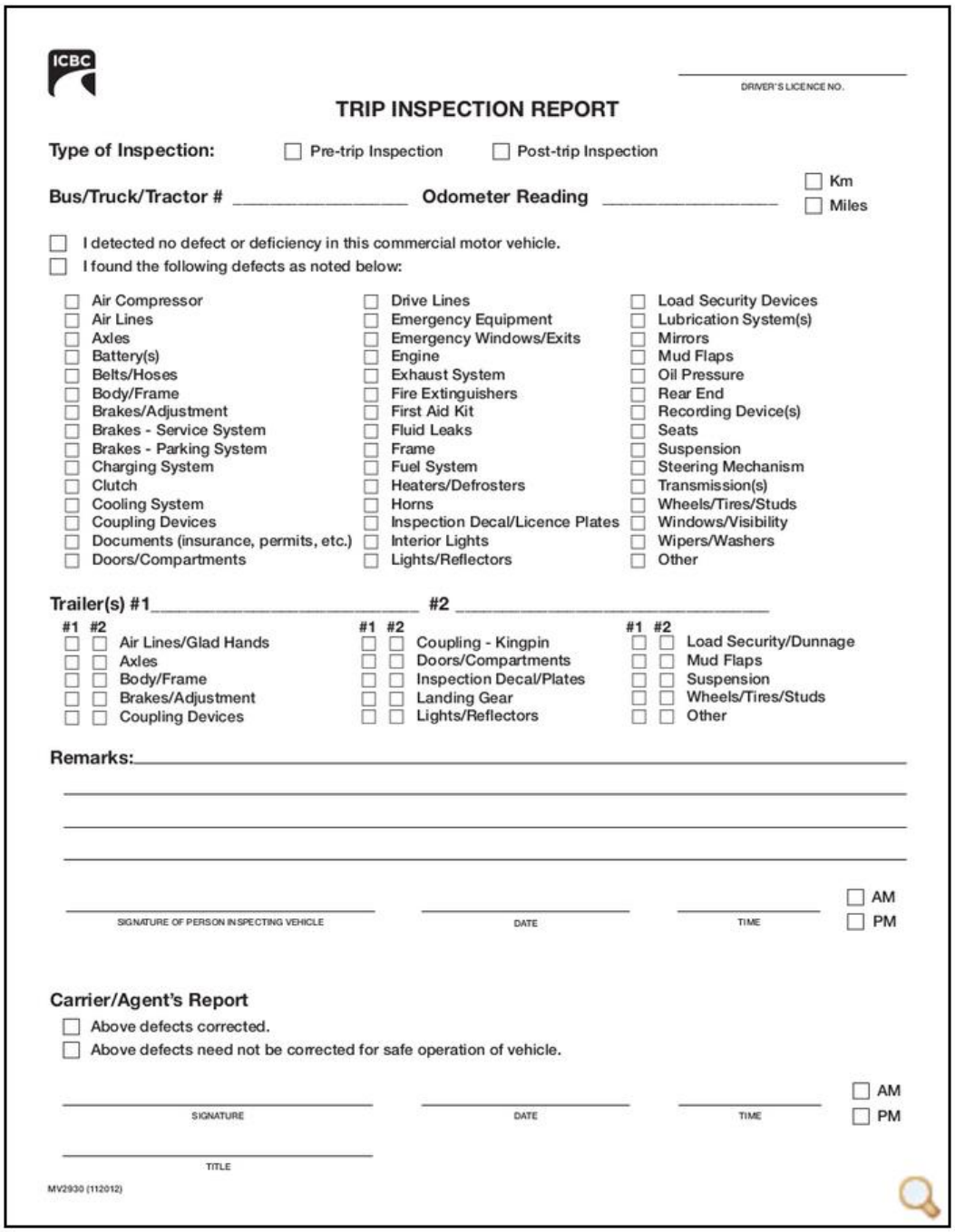
- Post trip inspections should be reviewed and practiced at the end of the driving lessons, where appropriate.
- The driver will record the trip mileage and note any repair issues in process of signing off on the inspection.

Formal practical assessments

- Provide students with a copy of the formal practical assessment forms for these activities. Once they feel they are ready, conduct the formal assessments.
- Students must twice successfully demonstrate a full vehicle pre-trip.
- Keep the assessment forms (paper or electronic) in the student records.

ICBC trip inspection report

Later in the course, provide students with a copy of the ICBC trip inspection report. Explain that they will be given this form by their ICBC driver examiner to complete after their pre-trip test. Briefly review it so that the students are familiar with it as it looks different than the ones they will use as drivers.



ICBC

DRIVER'S LICENCE NO.

TRIP INSPECTION REPORT

Type of Inspection: ☐ Pre-trip Inspection ☐ Post-trip Inspection

Bus/Truck/Tractor # _____ **Odometer Reading** _____ ☐ Km ☐ Miles

☐ I detected no defect or deficiency in this commercial motor vehicle.
☐ I found the following defects as noted below:

☐ Air Compressor	☐ Drive Lines	☐ Load Security Devices
☐ Air Lines	☐ Emergency Equipment	☐ Lubrication System(s)
☐ Axles	☐ Emergency Windows/Exits	☐ Mirrors
☐ Battery(s)	☐ Engine	☐ Mud Flaps
☐ Belts/Hoses	☐ Exhaust System	☐ Oil Pressure
☐ Body/Frame	☐ Fire Extinguishers	☐ Rear End
☐ Brakes/Adjustment	☐ First Aid Kit	☐ Recording Device(s)
☐ Brakes - Service System	☐ Fluid Leaks	☐ Seats
☐ Brakes - Parking System	☐ Frame	☐ Suspension
☐ Charging System	☐ Fuel System	☐ Steering Mechanism
☐ Clutch	☐ Heaters/Defrosters	☐ Transmission(s)
☐ Cooling System	☐ Horns	☐ Wheels/Tires/Studs
☐ Coupling Devices	☐ Inspection Decal/Licence Plates	☐ Windows/Visibility
☐ Documents (insurance, permits, etc.)	☐ Interior Lights	☐ Wipers/Washers
☐ Doors/Compartments	☐ Lights/Reflectors	☐ Other

Trailer(s) #1 _____ **#2** _____

#1	#2		#1	#2		#1	#2	
☐	☐	Air Lines/Glad Hands	☐	☐	Coupling - Kingpin	☐	☐	Load Security/Dunnage
☐	☐	Axles	☐	☐	Doors/Compartments	☐	☐	Mud Flaps
☐	☐	Body/Frame	☐	☐	Inspection Decal/Plates	☐	☐	Suspension
☐	☐	Brakes/Adjustment	☐	☐	Landing Gear	☐	☐	Wheels/Tires/Studs
☐	☐	Coupling Devices	☐	☐	Lights/Reflectors	☐	☐	Other

Remarks: _____

_____

_____

_____

_____ SIGNATURE OF PERSON INSPECTING VEHICLE _____ DATE _____ TIME ☐ AM ☐ PM

Carrier/Agent's Report

☐ Above defects corrected.
☐ Above defects need not be corrected for safe operation of vehicle.

_____ SIGNATURE _____ DATE _____ TIME ☐ AM ☐ PM

_____ TITLE

MV2930 (112012)

Resources

Vehicle inspections and standards

https://www.cvse.ca/vehicle inspections.htm

Vehicle inspection manuals: Vehicle safety & inspection standards online.

http://www.vsis.ca/

CVSE – List of inspection stations, contact information and hours of operation

https://www.cvse.ca/inspection stations.htm

Weigh2GoBC inspection stations

https://www2.gov.bc.ca/gov/content/transportation/vehicle-safety-enforcement/services/weigh2gobc-join/weigh2gobc-inspection-stations

Preventative maintenance program (PMP)

https://www.cvse.ca/references publications/booklets1-4/pdf/Booklet 4 Preventative Maintenance.pdf

National safety code standards

https://ccmta.ca/en/publications/national-safety-code/national-safety-code-single-standards

Commercial vehicle safety alliance (CVSA)

Of interest on this website are the *Brake Safety Week Results* for current and past years.

https://www.cvsa.org/

Driving techniques

Unit overview

Driving techniques are taught primarily in-cab however there is value in introducing and reviewing various techniques and information in class. In class lessons can prepare students for what is coming up in their driving lessons and later, after having some experience, reviewing techniques in the class can help reinforce the learning and help student understand what is going on with the truck and trailer.

In particular, classroom lessons on shifting and turning can be of value. Note that backing and coupling are covered in their own units.

Some of the learning outcomes from the *Framework Module 3, driving techniques* are listed in other lessons where they best fit. This includes *weights and dimensions* and *notice and order* in the *documents and regulations* lesson and the *fuel efficiency* online unit.

There is also a lot of blending of content between the driving techniques information and the defensive and cooperative driving information where the driver's control techniques are applied to roadway and traffic conditions.

Organize and teach this information where it best fits into your course. This lesson plan simply provides some ideas on how you can do that.

Materials

- Model tractor-trailers
- Roadway mock-up
- Whiteboard or flipchart and markers.

Note: there are no slides provided for this lesson. Schools should determine what visual aids would be appropriate.

Time to complete the unit:

- Approximately four hours in the classroom
- A total of 50 hours minimum is designated for in-cab driving - incorporating driving techniques and defensive driving.

Learning outcomes from the MELT framework

3.1. Prepare and start to drive a commercial vehicle.

Learning indicators

3.1.1. Explains the importance of being fully alert when driving and the importance that judgment is not impaired in any way while driving.

3.1.2. Describes ways to check and remove vehicle restraints and other loading dock devices.

3.1.3. Explains the importance of proper start-up and warm-up procedures.

Performance elements

3.1.4. Applies a method for confirming that they are fully alert and their judgment is not impaired in any way before beginning to drive.

3.1.5. Confirms every time before leaving the driver's seat; that the vehicle is secured by the vehicle's parking brake, wheel chocks or suitable blocks.

3.1.6. Enters and exits the cab, or the vehicle cargo area, maintaining a three-point contact, and explains the risks of improperly climbing onto or jumping from equipment.

3.1.7. Locates required vehicle documents such as permit books, vehicle registration, insurance, bills of lading, etc.

3.1.8. Confirms all required vehicle and cargo documents are valid and correct.

3.1.9. Adjusts the driver's seat to the correct position before driving.

3.1.10. Inspects, wears and properly adjusts seatbelt before driving.

3.1.11. Sets up mirrors to minimize the vehicle's blind spots.

3.1.12. Monitors the engine, instrument panel and indicator lamps.

3.1.13. Starts the engine correctly.

3.1.14. Listens for normal vehicle sounds, while starting the vehicle's engine and avoiding unnecessary idling.

3.1.15. Scans all controls and instruments before driving.

3.2. Comply with operational regulations that apply to commercial vehicles.

Learning indicators

3.2.3. Explains how to comply with specific requirements for using toll routes and bridges, and scales.

3.2.4. Explains that steep grades require different driving techniques for different locations and how to properly use emergency runaway lanes.

3.2.5. Explains the times, days and/or weeks when commercial vehicle operations are restricted in certain urban areas and imposed through municipal bylaws.

3.2.7. Explains the need to carry the emergency equipment required for certain commercial vehicle operations.

3.2.9. Explains the importance of respecting local bylaws restricting vehicle loading and unloading activities, parking and idling.

3.2.10. Identifies routes that prohibit commercial vehicles.

3.2.12. Explains safe and legal procedures when entering or exiting a scale and when being pulled over by enforcement officers.

Performance elements

3.2.13. Reads all road signage with particular messages that apply to commercial vehicles.

3.2.14. Takes extra care when crossing railway tracks, and before crossing, determines the space available for vehicles.

3.2.15. Shifts gears while crossing railroad tracks only when necessary.

3.2.16. Enters vehicle inspection facilities, or pulls off the roadway, when instructed by an officer or highway signage.

3.3. Operate a commercial vehicle in a safe manner and perform basic driving manoeuvres

Learning indicators

Performance elements

3.3.3. Uses effective observation skills.

3.3.4. Manages space and speed.

3.3.5. Operates vehicle controls smoothly.

3.3.6. Communicates correctly and in a timely manner to other road users.

3.3.7. Pays attention to traffic, the vehicle, driving conditions, and other road users.

3.3.8. Drives through curves, to the right and to the left, in a safe manner.

3.3.9. Ascends steep grades in a safe manner on both urban streets and on higher speed roads.

3.3.10. Descends steep grades in a safe manner on both urban streets and higher speed roads.

3.3.11. Changes lanes in a safe manner on both urban streets and higher speed roads.

3.3.12. Crosses intersections in an urban setting in a safe manner.

3.3.13. Turns at intersections in an urban setting in a safe manner.

3.3.14. Enters a highway/freeway in a safe manner.

3.3.15. Exits a highway/freeway in a safe manner.

3.3.16. Makes efficient and courteous use of passing lanes.

3.3.17. Applies safe driving technique when proceeding through construction zones and detours.

3.4. Use fuel-efficient driving habits (Note: there is a separate online unit on fuel efficient driving containing all of the detail. Aside from that, this topic should be reinforced throughout the course at appropriate times.)

Speed management

Some of the content on braking is covered in the air brakes unit.

Key topics:

- Stopping time and distance
- Proper use of brakes – not for use on downhills
- Planning ahead - manual and automated transmissions
- Following distance
- Speed and weight facts
- Speed management when bobtailing
- Traffic flow
- Using cruise control
- Consequences of speeding
- Driving faster/slower than the flow
- Hills / mountains
- Watching gauges.

Gear shifting

Provide an initial 20 – 30 minute classroom lesson on basic clutch and shifter operation and then, after students have been driving for a few days, do a review and provide more detailed information on shift patterns and techniques.

You may use a driving simulator suitable for shifting as a teaching tool for this lesson. Time spent on a simulator counts as theory, not practical.

Key topics:

- Types of transmissions
- Tips for smooth shifts
- Progressive shifting
- Clutch and brake operation
- Shifting non-synchronized transmissions
- Skip shifting
- Automated transmissions
- Shifting on hills / mountain driving
- Watching gauges when shifting.

Negotiating roadways and traffic

Use model tractor-trailers and a mocked up street system to illustrate some of these manoeuvres.

Key topics:

- Entering traffic or merging
- Exiting a major roadway
- Weave zones
- Zipper merging
- Lane changes
- Passing
- Vehicle components to monitor
- Intersection strategies
- Steering methods
- Off-tracking
- Left and right turns
- Negotiating intersections
- Traffic circles and roundabouts
- Crossing intersections
- Curves.

Mountain driving and grades

Spread your information on mountain driving and grades throughout the theory and practical training where appropriate.

Key topics:

- Driving upgrades
- Shifting on an upgrade
- Driving upgrade in adverse conditions
- Driving downgrades
- Shifting on a downgrade
- Engine brakes or retarders
- Planning your decent
- Runaway lanes
- Automated transmissions on downgrades
- Gauges.

Railroad crossings

Key topics:

- Controlled and uncontrolled crossings
- Crossing procedures
- Vehicle stalled or stuck on the tracks
- Rural crossings
- Common driver errors at crossings.

Practical training connection

Learning outcomes in this unit are primarily taught and practiced in the truck. Please see the *Class 1 MELT practical lesson plans* for more information.

Driving techniques and defensive driving review quiz – answer key

1. What is the safe way to enter and exit the vehicle? (Use 3 point contact rule: three of your four limbs are always in contact with the vehicle, and you only move one hand or one foot at a time.)

2. What is the only time it is safe for you to get out of the driver seat without applying the parking brakes? (When your wheels are properly chocked.)

3. What are the dangers of driving a vehicle with underinflated tires? (Can lead to overheating and tire blowout.)

4. Should you let air out of hot tires so the pressure goes back to normal? (No.)

5. As a professional driver, what can you do to help other drivers safely pass your vehicle? (Reduce your speed and give them room.)

6. How can large vehicles travelling at high speed affect smaller vehicles? (By creating air turbulence that can affect the handling of smaller vehicles.)

7. When and why should you manually downshift automatic/automated transmissions? (To get greater engine braking when going down grades.)

8. List two ways to know when to shift gears. (Engine sound, engine speed on the gauge).

9. List at least three tips to help other road users be aware of your presence and understand your intentions? (3 marks)

Answer (any three of)

   - Eye contact
   - Tap the horn lightly or at night flash lights when passing
   - Signal early and change lanes slowly and smoothly
   - Brake lights to warn drivers behind you if you need to slow down
   - Use 4-way flashers when backing and when parked on the side of the road.

10. Whose responsibility is it to ensure everything regarding the vehicle is in proper working order? (The driver.)

11. How does proper engine warm up prepare the engine to do its job? (By circulating oil, lubricating parts and building oil pressure to proper levels.)

12. True or False? A driver is required to carry the vehicle registration for both the truck and trailer? (True.)

13. In what direction must you travel around a circular intersection with a centre island? (To the left - counter-clockwise.)

14. When stopping for a train at a railroad crossing, how close can a tractor-trailer be to the nearest track? (No closer than 5 metres.)

15. What are the two considerations when calculating safe following distance for a tractor-trailer? (Driving conditions and vehicle length.) (2 marks)

16. How do you calculate following distance? (Counting one-thousand-and-one, one-thousand-and-two to determine one second for every 3 m (10 ft) of overall length. A minimum of five seconds regardless of length.)

Resources

Detroit DT12 transmission videos

Driving with automated manual transmissions (4:05):

https://demanddetroit.com/video/3326

Link to several short videos on operating this transmission:

https://demanddetroit.com/dt12transmission/

Decent control when using cruise control (1:09)

https://demanddetroit.com/video/3077

Turning

This video is a combination of voice-over slides, photo and video. USA.

CDL College: Turns in a big rig. (15:24).
https://www.youtube.com/watch?v=FCGw1Qu3sss

Logging truck takes corner on two wheels before completely tipping over minutes later. Port Alberni, March 2019.

https://www.cbc.ca/news/canada/british-columbia/port-alberni-truck-tipping-over-1.5058140

Railway safety

A variety of print resources and testimonials about railway incidents.

https://www.operationlifesaver.ca/resources/

Excellent overview of rail safety for commercial vehicle drivers. Operation Lifesaver (USA site): *Rail safety for cement, dump and garbage truck drivers (*3:36)

https://oli.org/materials?name=&file_type=remote_video&material_type=All&audience=All&topic=119

Signs, signals and road markings

Unit overview

Time required: varies / optional

Part of MELT framework Module 3 - Driving techniques.

Reference - Student Guide, Chapter 7.

How much detail you get into with this topic will depend on your students' background and knowledge. Most students should know the basic driving rules, however it is common for even experienced drivers to be unclear on some of them.

Students have passed the Class 1 knowledge test, so will likely have studied the *Driving Commercial Vehicles guide (DCV).* Chapter 7 in the student guide contains all of the same signs, signals and road markings information found in the DCV.

If you have new Canadians and temporary foreign workers in the class, you should spend a bit more time to ensure they know the signs, signals and markings commonly used in North America that may be unfamiliar to them. Even within Canada, there are a few differences between Provinces.

Have the students lead the discussions about what is different for them and what they aren't clear on.

Materials

- Audio/visual equipment
- Slide presentation

Learning outcomes from the MELT framework

3.2.13. Reads all road signage with particular messages that apply to commercial vehicles.

3.3.1. Explains the meaning of all road signs and markings.

3.3.2. Explain traffic regulations that apply to commercial vehicles.

Introduction

Slides 1 - 2

Ask: Why do we have traffic control devices?

Answers may include:

- To guide, warn, and regulate the flow of traffic
- To keep traffic organized and flowing smoothly
- To help reduce crashes
- To help ensure the safety of pedestrians and other vulnerable road users.

Why is it especially important for big trucks to obey traffic control devices?

Answers may include:

- Public expectations
- Huge consequences of crashes or incidents

Signs, signals and road markings review

Slides 3 to 26

- Review how signs are classified by shape and colour.
- Discuss lane control signals and traffic lights.
- Discuss that road markings help keep vulnerable road users safe and help prevent conflicts with other drivers.
- Discuss that some signs are specific to commercial vehicles.

Practical training connection

Looking for and explaining signs, signals, and road markings should be an ongoing requirement of students during their on-road lessons.

Backing

Unit overview

Part of MELT framework Module 5 – Off-road tasks and manoeuvres.

Reference - Student Guide, Chapter 10.

Time required:

- Classroom - 2 hours
- In-cab individual backing – 12 hours

Materials

- A few model tractor-trailers
- Handouts
- Audio/visual equipment
- Whiteboard or flipchart and markers
- Slide presentation
- Video links

Videos

- Offset backing (right and left) (5:14) https://www.youtube.com/watch?v=0u25cTDYEoQ
- Alley-dock backing (3:31) https://www.youtube.com/watch?v=0DMh70Co_jI
- Parallel parking (1:53)

Learning outcomes from the MELT framework

5.1. Perform backing and parking manoeuvres with a tractor-trailer.

5.1.1. Performs straight-line backing manoeuvres with a tractor-trailer unit in a safe manner.

5.1.2. Performs offset backing manoeuvres with a tractor-trailer, to the right and to the left, in a safe manner.

5.1.3. Performs alley-dock backing manoeuvres with a tractor-trailer, to the right and to the left, in a safe manner.

5.1.4. Optional: Performs parallel parking manoeuvres with a tractor-trailer in a safe manner.

Backing basics

Slides 1-2

Discuss backing with a single unit vs. backing with a trailer.

Discuss sight-side vs blind-side backing.

- Sight-side backing is backing toward the left side of the vehicle. The driver can see the intended trailer path. Sight side backing is preferred, as the driver has maximum visibility.
- Blind side backing is backing toward the right side of the vehicle. The driver has limited visibility. Blindside backing should be avoided when possible. Use a guide or stop often and get out and look to check your position.

General tips for backing

Slides 3-4

Read/review this section in the student guide with the students.

- Start in the best position
- Adjust your mirrors
- Turn on 4-way flashers
- Get out and look (GOAL)
- Silence your audio and roll down the window
- Sound horn
- Use mirrors on both sides
- Back slowly - don’t be in a hurry
- Back and turn toward the driver's side (not blind-side) when possible
- Back out of traffic
- Use a guide

Backing aids

Slides 5-6

Discuss backing aids

- Rear camera
- Surround-view monitor or around-view monitor systems
- Back up warning systems
- Using a guide

Emphasize the benefits of using a reliable guide whenever one is available. The guide should stand near the back of the vehicle where they can be seen in the driver's side mirror. If you can't see your guide, **stop!**

The slides and student guide shows guide hand signals.

Activity

- Have student stand and practice the guide hand signals
- Emphasize that both the driver and the guide should have an understanding of what signals will be used when backing up.
- Students will have an opportunity to practice backing with a guide.

Four backing manoeuvres

90 minutes

Review the four backing manoeuvres using the student guide, model tractor-trailers, diagrams, slides and videos.

Straight line backing

Slide 7

Straight line backing is the simplest manoeuvre to learn. It is fundamental in learning all other backing manoeuvres.

Alley-Dock backing

Slide 8

90 degree alley dock backing involves backing while turning into a space that is 90 degrees to the truck. It most often occurs at loading docks when the driver must back in from off the street or between two vehicles.

Offset backing

Slide 9

Video

Watch a video on offset backing (right and left) (5:14)
https://www.youtube.com/watch?v=0u25cTDYEoQ

Parallel parking

Slide 10

Parallel parking involves backing into a space along a curb or dock. It is similar to off-set backing.

Video

CDL parallel parking – Mooney CDL Training (1:53)

https://www.youtube.com/watch?v=EHjK7ZWkDOI

Backing review quiz – answer key

1. Prior to reversing, what should the driver check for when walking around the vehicle? (Obstacles, hazards, clearance.)

2. When using a guide to help you back into a space, what are the two most important things to remember? (Agreed upon hand signals and the guide must maintain eye contact at all times, in the mirror, with the driver.)

3. Regarding backing a tractor-trailer, if the rear of the tractor moves to the left, which way does the rear of the trailer move? (To the right.)

4. When using a guide in backing, who is responsible for any problems that arise from the backing manoeuvre? (The driver.)

5. If a driver has to back and turn, which side is it safer to back and turn towards? (Driver's side of the vehicle (left side).)

6. When preparing to back, if your tractor doesn't have a backup alarm, what should you do before you start backing? (Sound your horn and turn on your flashers.)

7. What are four steps you can take to help avoid incidents and crashes when backing up? (Get out and look, use a guide, turn on flashers and sound the horn.)

Practical training connection

Students have a minimum of 18 hours of individual backing practice in the MELT program. See the Class 1 MELT Practical Training Lesson Plans for detailed information.

For their formal assessments, they must be able to perform each of the mandatory backing manoeuvres twice, without assistance or coaching.

Refer to MELT assessment form: Class 1 Backing Assessments (MV7604G)

Space requirements for backing assessments

- Straight-line backing - in a space between 3.5 m and 3.7 m wide, and 30 m long.
- Offset backing - from a space that is between 3.5 m and 3.7 m wide, and at least as long as 2/3 the length of the tractor-trailer, into an adjacent space of the same dimensions. The pull-up space in front of the two spaces described must be at least one and one half times the length of the tractor-trailer. The manoeuvre will be assessed from both sides.
- Alley dock backing - into a space that is between 3.5 m and 3.7 m wide, and at least as long as two thirds the length of the tractor-trailer, starting with the vehicle positioned perpendicular to the space. The pull-up space in front of the backing target space must be no deeper than the length of the vehicle. The manoeuvre will be assessed from both sides.

Coupling and uncoupling

Unit overview

Part of MELT framework Module 5 – Off-road tasks and manoeuvres.

Reference - Student Guide, Chapter 10.

Time required:

- Classroom - 1 hour
- In-yard – 1 hour coupling, sliding the fifth-wheel and trailer axle demo and discussion
- In-cab – individual coupling – 6 hours

Materials

- Audio/visual equipment
- Coupling slide presentation
- Whiteboard or flipchart and markers

Videos

Joe's Story: Short-Haul Truck Driver Safety (3:08)

How to use air suspension to help with coupling. (:46).

https://safetydriven.ca/resource/making-your-truck-work-for-you-picking-up-the-trailer/

Using air suspension when dropping the trailer. (1:12).

https://safetydriven.ca/resource/making-your-truck-work-for-you-dropping-the-trailer/

Coupling and Uncoupling Tutorial. (13:30). https://youtu.be/VPJ1biinnx8

Learning outcomes from the MELT framework

5.2. Safely perform tractor-trailer coupling and uncoupling tasks.

5.2.1. Couples a tractor-trailer in a safe manner.

5.2.2. Uncouples a tractor-trailer in a safe manner.

5.2.3. Adjusts a vehicle's fifth wheel setting, axle position, or suspension system.

5.2.4. Checks load on axle weights at a scale (during on-road training).

Overview of coupling and uncoupling

Time required: 45 minutes

Slides 1 – 6

Introduction

Slide 1

Video – WorkSafeBC – Joe's story: short-haul truck driver safety

Introduce and show this video from WorkSafeBC.

Meet Joe: Father, truck driver, cooking show enthusiast. Watch what happens when his life takes a bad turn after he injures his back while operating the landing gear on his trailer.
Joe's Story: Short-Haul Truck Driver Safety (3:07)

Sliding the fifth-wheel and trailer axles

Slide 2

Discuss when and why you would want or need to adjust the position of the fifth-wheel and the trailer axles.

- The need to know the legal axle weights
- How the weight distribution is transferred between axles and fifth-wheel
- Wheel-base and rear overhang legal requirements

Review the steps for both procedures in the student guide and discuss safety procedures.

Coupling a tractor-trailer

Slide 3

Review the step-by-step procedure in the student guide.

- Inspection of the yard prior to coupling
- Align tractor and trailer

- Inspection of the tractor
- Inspect the trailer
- Connect the trailer
- Tug test
- Confirm fifth wheel is locked, raise the landing gear and connect air lines
- Supply air check

Slide 4

Activity – video: How to use air suspension to help with coupling (0:46).

https://safetydriven.ca/resource/making-your-truck-work-for-you-picking-up-the-trailer/

Uncoupling a tractor-trailer

Slide 5

Review the step-by-step procedure in the student guide.

- Location inspection
- Park tractor-trailer in a straight line and secure the tractor
- Adjust suspension
- Lower landing gear
- Remove connections
- Unlock and disengage the fifth wheel
- Confirm stability of trailer
- Clear trailer

Slide 6

Video - Using air suspension when dropping the trailer (1:12)

https://safetydriven.ca/resource/making-your-truck-work-for-you-dropping-the-trailer/

Practical training connection

Time required: 1 hour

In-yard activity – couple/uncouple demonstration

After the 45 minute classroom discussion, go immediately to the yard and demonstrate sliding the fifth wheel and trailer axle, coupling and uncoupling. Stop and discuss with questions to the students at appropriate times.

After the yard activities, return to the classroom for 15 minute review.

Off-road practice and assessments – Note: students have a minimum of six hours of individual practice, including assessments, throughout the rest of the training.

Refer to MELT assessment forms:

- Class 1 Coupling/Uncoupling Assessment (MV7604E).
- Class 1 Chain-up, Fifth Wheel Slide, Trailer Axle Slide (MV7604F).

Coupling review

Time required: 15 minutes

Slide 7

Time permitting, show the video as a review or provide the link for students to watch on their own time.

Video – J-Tech - Coupling and Uncoupling Tutorial

Step-by-step instruction on how to uncouple and couple a tractor trailer. Presented by J-Tech. April 15, 2015

https://youtu.be/VPJ1biinnx8 (13:30)

Give students a few minutes to complete the coupling review quiz in their workbook. Review the correct answers.

Coupling review questions – answer key

1. What three things must you inspect on a tractor before coupling a trailer? (Gladhands, electrical cord and fifth wheel.)
2. Before coupling to a trailer, what do you need to check on the trailer? (Check that the trailer is secure with spring brakes or wheel chocks.)
3. How can you ensure that the fifth wheel is properly engaged? (Do a tug test.)
4. What can you do to protect your back when cranking the landing gear? (Support the body by placing a hand on the trailer.)
5. How do you check that the fifth wheel jaws have locked to the trailer king pin? (Go under the truck and look – using a flashlight if needed.)

Optional topics

Pintle-hitch attachments

Discuss Pintle-hitch attachments and review the basic steps in coupling and uncoupling.

Double trailer combinations

Review different combinations of trailers and tips for coupling and uncoupling.

Double trailer combination types:

- A-train
- B-train
- C-train.

Tire chains

Time required:

- Classroom: 1 hour (45 minutes, plus 15 minute review with quiz)
- In-yard: 2 hours, including assessment.

Materials

- Several types of chains
- Review questions
- Audio/visual equipment
- Slide presentation
- Video links

Learning outcomes from the MELT framework

5.3	Apply chains to a tire on a tractor-trailer
5.3.1	Correctly fits and secures chains to a tire.
5.3.2	Removes and correctly stores tire chains.
5.3.3	Identifies and replaces a broken tire chain.

Tire chain requirements

Slide 1

Introduce the topic.

Tire chains can be the most important item you attach to your big rig. They provide necessary traction in snow, icy or muddy conditions.

In some cases tire chains are required for your vehicle to operate. In fact, you can be fined for not having them.

The B.C. Ministry of Transportation will have signs posted. Any vehicle found crossing that point without proper tires is subject to a fine.

From the MoTI website: Drivers must obey winter tire and chain signs throughout the province from **October 1 to April 30**. For select highways not located through mountain passes and/or high snowfall areas, tire and chain requirements end March 31.

Chain configurations

Slide 2

Depending on the LGVW, vehicle type, and configuration of commercial vehicle, the requirements vary for type, number, and placement of chains or acceptable traction devices.

Have students refer to this chart in the student guide and review some examples.

How to install tire chains

Slides 3-5

Review the steps to install and remove chains.

Slide 6 **-** Activity – video

Show the MOTi video or other video on installing chains.

B.C. Ministry of Transportation video: *How to Put Tire Chains on a Commercial Vehicle* (7:59) – on YouTube.

https://www.youtube.com/watch?v=SKcibc-Qc78

Note: provide video link to students so they can re-watch on their own time.

Practical training connection

In-yard activity – chain-up demonstration, practice and assessment

Required time: two hours

Supplies needed

- Several sets of chains for the truck(s) being used
- Bungies, as needed
- D-cam tightener for each pair
- Students should provide their own gloves but have a couple of pairs on hand in case they don't.

Teach this as a group activity. A maximum of four students per instructor. Alternately, chain-up could be taught 1-1.

- Go out to the yard and demonstrate installing chains on a tractor.

- In pairs, have students practice several times with different type of chains, if possible.
- If available, give students the wrong type or size of chains and see if they can figure out that they are wrong.
- Have each student do a final demonstration without assistance or coaching and check off the first of two formal assessments for this activity.
- The second formal assessment must be done on a different day or in a different location.

Refer to MELT assessment form: Class 1 Chain-up, Fifth Wheel Slide, Trailer Axle Slide (MV7604F).

Chain-up review

Time required: 15 minutes classroom

Once everyone has completed the chain-up task, go back into the classroom, answer any questions and have students complete the review quiz in their workbook. Briefly review the correct answers.

Chain-up review questions – answer key

1. What is the purpose of tire chains? (They significantly increase traction in mud, snow and ice, as well as improving overall braking distance.)

2. List two disadvantages of tire chains.

Answers:

- They reduce fuel efficiency
- The allowable speed of the vehicle drops to 50 km/hour
- They are harmful to developed roads.

3. Between what dates are chains required? (Between October 1 and April 30.)

4. List three common causes of tire chain failures.

Answers:

- Driving too fast with chains
- Driving on dry roads with chains for extended periods of time
- Not securing the chains tightly enough
- Accelerating too rapidly causing tire spin and stress on chains.

Resources

MoTI website information. November 18, 2018.
What You Need to Know About Stricter Chain-Up Rules

Defensive and cooperative driving

Unit overview

Part of MELT framework Module 3 – Driving techniques and Module 4 – Professional driving.

Time required: 1.5 hours in the classroom.

Materials required

- Student workbooks
- Audio/visual equipment
- Whiteboard or flipchart and markers
- Slide presentation: Defensive and cooperative driving.

Learning outcomes from the MELT framework

Learning indicators

3.3.3. Uses effective observation skills.

3.3.4. Manages space and speed.

3.3.5. Operates vehicle controls smoothly.

3.3.6. Communicates correctly and in a timely manner to other road users.

3.3.7. Pays attention to traffic, the vehicle, driving conditions, and other road users.

4.1.1. Explains the importance of defensive and cooperative driving habits.

4.1.2. Describes common crash scenarios and contributing factors, and explains ways to avoid.

4.1.3. Explains the visual clues and other signs of potentially hazardous traffic situations.

4.1.4. Explains duty of care — to proactively protect other road users from harm.

4.1.5. Explains responsibility to sharing the road with pedestrians and other road users, and the consequences of failing to do so.

4.1.6. Appreciates why they should offer help to other commercial drivers who need assistance.

4.1.7. Explains how the additional size and weight of their vehicle may be perceived by other road users.

4.1.8. Explains how the laws of motion apply to driving.

4.1.9. Describes how steering control is lost when tires skid during heavy brake use or when braking with poor traction.

4.1.10. Explains how personal factors such as driving motives, driving experience, health, impatience/aggression, and overconfidence affect risk perception and driving choices.

4.1.11. Explains how to adapt to driving at night.

Performance elements

While these learning outcomes will mostly be covered in cab, some of these concepts can be introduced in class.

4.1.12. Observes and critiques own habits to identify ways to improve.

4.1.13. Monitors the actions of other drivers, changing weather, and changing road surfaces and conditions.

4.1.14. Adjusts driving techniques to match the vehicle configuration, cargo weight, centre of gravity, and driving experience.

4.1.15. Assesses and adapts to changing conditions, including adverse driving conditions.

4.1.16. Drives safely at night (Practical application dependent on time of year).

4.1.17. Recognizes and takes steps to avoid situations that might cause anger, hostility or danger.

4.1.18. Is courteous, and yields to other motorists, cyclists, pedestrians and slow-moving vehicles.

4.1.19. Adapts to the presence of other motorists, pedestrians, cyclists and slow-moving vehicles which share the road with commercial vehicles.

4.1.20. Watches for wildlife or livestock which can enter the space around a vehicle, particularly on routes known for collisions involving animals.

4.1.21. Scans mirrors, instruments and gauges regularly and systematically.

4.1.22. Exits the vehicle whenever necessary to inspect clearances and identify potential obstructions.

4.1.23. Maintains an appropriate following distance in all driving conditions.

4.1.24. Maintains attention and avoids sources of distraction while driving.

4.1.25. Maintains vehicle speed that is appropriate for conditions, and adheres to regulations.

4.1.26. Monitors the movement and actions of other motorists while passing or being passed.

4.1.27. Observes traffic patterns and other road users, and selects a safe roadside location for stopping and/or parking, and resumes safely back into traffic.

Using existing driver training materials

Defensive driving unit - If you currently offer a defensive driving unit at your school and want to use or adapt it, review the information in the student guide and the learning outcomes listed at the front of this unit to ensure you're covering everything. Ensure you're covering the concept of cooperative driving.

Choice of driving system - There are a variety of ways to organize and teach good driving habits and attitudes and your school may already be using a system that works well for you and your students.

ICBC materials often refer to **See-Think-Do** which offers the same information as **SIPDE** (Scan-Identify-Predict-Decide-Execute), a commonly used system. The Smith System is another system sometimes used by driving schools.

Whichever system you choose to use, review the information in the student guide and learning outcomes listed at the front of this unit to ensure you're covering everything.

Practical training connection

Pre-driving assessments

Some schools have found it very useful to do an initial driving assessment in a passenger vehicle with their Class 1 students. This assessment allows the instructor to gauge the student's general driving skills (things like eye-lead-time, space and speed management) and begin to fix bad habits that will get the driver into trouble if the bad habits are transferred to a commercial vehicle. You may use **flexible time** for this activity.

Commentary driving

A good way to practice hazard detection is commentary driving. This is a technique where the driver talks about their main observations and interpretations of the events developing around and ahead of their vehicle.

Demonstrate this in-cab and have the student use this method periodically throughout the course. This is the best way to assess what they are seeing, thinking, and planning to do.

"What if" questions for crash avoidance

Look for developing situations on the road where there is a potential for conflict. Staying several steps ahead of the student, ask "What if?" questions to encourage them to analyze what might be developing, consider options and make good decisions. Situations to look for include:

- vehicle ahead – travelling in same direction
- vehicle behind – travelling in same direction
- oncoming vehicle
- vehicle approaching an intersection or at an angle
- another vehicle passing you
- you passing another vehicle
- potential sideswipe collision
- vulnerable road users (pedestrians, bicycles, motorcycles).

Defensive and cooperative driving

Slides 1 – 2

Provide an overview of the lesson.

Slide 3

Display these words and ask students to discuss what they mean to them:

- defensive driving
- pro-active driving
- cooperative driving.

There is no one correct answer. This initial discussion is to get students to think about how they think about driving, allow them to share their experiences and introduce them to the concepts of defensive and cooperative driving. Use questions to get the students to expand on their ideas.

Some definitions (add in some of your own):

Defensive driving

- Using driving strategies that minimize risk and help avoid collisions.
- Involves being **proactive** and anticipating potential conflicts and hazardous situations and taking action early to eliminate the conflict.

Cooperative driving

- Analyzing how you are affecting others rather than just how others are affecting you
- Driving in a way that assists the safe flow of traffic and use of the roadway. This fosters a pro-social mindset and the understanding other road users perspectives in a not-so-perfect driving environment.
- Never using your vehicle to intimate or bully other vehicles on the road.

Zones of awareness

Slide 4

Discussion: hazards can come from any angle and that their zone of awareness must include a full 360° area around the vehicle as well as above and below the vehicle.

Hazard detection system

Slide 5

Use your eyes to see and your mind to analyze what you see for potential dangers. A system that works well is see, think, and do:

See: scan and identify any real or potential hazards or conflicts

Think:

- Predict - Predict likely outcomes.
- Decide - Decide which course of action will lead to the desired outcome.

Do: execute your decision - put your plan into action.

Key points:

- Continuously scanning our surroundings on and off the road leads to good visual habits
- Scan to the sides and behind your vehicle
- Watch road signs and check your vehicle's instruments
- Your eyes should be continually moving from far to near
- You must avoid distractions while driving. Using the phone or radio, eating or other activities, and visual distractions outside of the vehicle, such as a cargo issue or traffic incident, can all cause you to miss key information.

Discuss eye-lead-time – scanning – left/centre/right checks.

Discuss blind spots around the vehicle.

Discuss eye health and having a current vision prescription.

Defensive driving and space management

Slide 6

Activity – video

This video provides an overview of space management.

PRO-TREAD: Defensive Driving and Space Management

https://www.youtube.com/watch?v=7u4n2vTHzoo (2:52)

You need to be aware of space occupied by your vehicle. You're the largest vehicle on the road and any other vehicle is small and fragile.

There are six sides to every truck (front, back, left, right, above, below). You must be mindful of all the possible obstacles and know how to effectively control your space.

Space in front

Space in front is most important. Making sure you have enough time to stop is the only way to avoid hitting the vehicle in front.

Emphasize the importance of staying within the speed limit. Otherwise, drivers will be constantly overtaking other drivers and having to pass. Drivers can never have the desired space in front if they speed.

Discuss how much space to leave in front and how that space increases as the length and the speed of the rig increases. 1 second driving time for every 10 feet of truck length. An extra second should be added if you are going over

Stress the professional driver's responsibility to maintain an adequate space cushion.

Stress the rule of adding more space because of bad weather, poor visibility, or bad road conditions. When conditions are less than ideal,

increase the number of seconds and adjust your following distance. Driving conditions are affected by:

- road conditions
- vehicle conditions
- your physical and mental condition
- traffic conditions
- lighting conditions
- weather conditions

Slides 7 – 10

Information contained on these slides is also in the air brakes unit. Use questions to briefly review.

- Stopping distance and stopping time
- Following distance
- Speed and weight effects on stopping distance
- Stopping power.

Space all around

Slide 11

Discuss the importance of spatial awareness all around the vehicle, using examples and stories and video clips.

- Space to the sides
- Space to the rear
- Space above

Good visual habits

Slides 12 - 13

Use questions to discuss good visual habits.

Key points:

- Continuously scanning our surroundings on and off the road leads to good visual habits.
- As well as looking ahead, you should be scanning to the sides and behind your vehicle.
- Watch road signs and check your vehicle's instruments. Your eyes should be continually moving from far to near.
- To do this well, you must avoid distractions while driving. Using the phone or radio, eating or other activities, and visual distractions outside of the vehicle, such as a cargo issue or traffic incident, can all cause you to miss key information.

Discuss blind spots.

Discuss eye health.

Watch and discuss the video.

Defensive driving – Keep your eyes moving

https://www.youtube.com/watch?v=2INaqewU518 (41 sec)

Engaging our other senses

Time required: 15 minutes

Slide 14 – What can these other senses tell you?

Have students discuss the questions in small groups or pairs for a few minutes, then ask them for their thoughts.

Use the information below to fill in the gaps.

Share a "senses" experience you've had when driving a commercial vehicle.

Hearing

- The sound of horns, sirens, and train whistles, children playing
- The sound of other vehicles
- The sound of your own vehicle can help you identify maintenance problems that can lead to a collision if left unattended
- Avoid playing the stereo or radio excessively loud and keep other in-vehicle noises at a low level.

Feeling

- Our bodies are in contact with various parts of the vehicle - hands on the steering wheel - body in the seat - feet on the pedals.
- The vibrations caused as the wheels roll over the road surface are transmitted to our bodies.
- Vibrations can tell us about the road surface and how our vehicle is holding the road.
- If the steering feels "light", the road is slippery.

Smelling

- These signals tend to be subtler and you will learn to interpret them with experience.
- Pay attention to the smell of hot oil, rubber, or anti-freeze. Early detection will allow you more time to find a safe location to park and have the problem dealt with.

Spider senses 

- When you just know something isn't right, pull over and inspect your vehicle.

Sharing the road

Slide 15

Key points:

- One of the most important aspects of proactive and defensive driving is recognizing potential hazards before they become a real hazard.
- Early recognition allows the time you need to avoid trouble. It is vitally important that you recognize and become immediately aware of what you see while driving.
- It is important to understand how other drivers perceive your vehicle. For example, they don't know how long it takes you to stop or that the trailer will track to the inside of the corner.

Discuss potential and real hazards from a commercial driver's perspective and discuss how others perceive the commercial vehicle.

- Pedestrians
- Cyclists
- Motorcycles and smaller vehicles
- Work zones
- Slow moving vehicles
- Emergency vehicles
- Horses

Driving conditions

Time required: 30 minutes

Slide 16 - 17

Activity – video

Show this video as a way to introduce the topic.

A couple driving near Moncton, New Brunswick approach a truck merging onto the highway just as a big chunk of frozen snow flew off of the truck, smashing the windshield on the passenger side.

Frozen Snow from Truck Smashes Car Window (1:08)

https://www.youtube.com/watch?v=jGNDPHqUslg

Discuss the six conditions of driving using questions to the class. As experienced drivers they should be able to explain

There are six basic conditions in any driving situation; your ability to adjust to these conditions will increase your chances of avoiding a collision. It is the driver's responsibility to adjust to these changing conditions.

- light
- weather
- road
- traffic
- vehicle
- driver.

Crash avoidance scenarios activity

Time required: 30 minutes

Slide 18

This activity allows the instructor to assess the students understanding of the defensive and cooperative driving strategies discussed in this unit.

Assign a few of the scenarios to each group and have them discuss the questions. They should be prepared to share their ideas with the larger group. Give them 10 minutes.

What risks or situations could happen when driving under these situations? How could you reduce your risk or the risk to others?

Group 1

- vehicle ahead – travelling in same direction
- another vehicle passing you
- ground clearance such as railway crossing.

Group 2

- vehicle behind – travelling in same direction
- vehicle approaching intersection or at an angle
- you passing another vehicle.

Group 3

- someone driving beside you
- oncoming vehicle
- overhead objects.

Risk tolerance activity

Time required: 45 minutes

Materials: activity page in student workbook.

This activity answers the question: *Why do we tolerate risk?* It helps drivers understand influences, motivation, and behaviour of themselves and other drivers. Students will better understand risk in general, including their own risk factors.

Divide the class into small groups.

Introduce and explain the activity.

Introduction to risk tolerance

- Everyone accepts some risk when they drive. The type and level of acceptable risk will vary by the individual, the situation, and their reasons for taking the risk.
- This activity will help us identify what influences our risk tolerance – why we do what we do.
- Our own reasons can be based on our values (what's important to us), our beliefs about what is true or not true and our motives (or reasons) when driving.
- Hopefully, awareness of our own risk tolerance will help us make better decisions.

Have students turn to the worksheet in their workbook*, Factors that influence risk tolerance.*

Discuss the first factor in-depth as an example.

Instructions for the groups

- Discuss examples of some of the risky things people do involving vehicles. See what categories your example might fit into.
- As a group, have the students come up with at least one different example for each of the factors listed. Have them consider their own driving and examples of others. Think about the "why?" What things let you take a risk? What excuses do you tell yourself? What could be some consequences? Be honest! Admitting to behaviour that isn't perfect doesn't mean you're a bad driver; it means you're human!
- Have one team member write down the results.

Monitor the groups to keep them on track. Provide examples as needed to keep the discussion going.

After about 15 minutes, bring the class back together and discuss the following questions:

- What stood out or surprised you?
- What examples did you discuss?
- What conclusions can you draw from the activity?
- Is there anything you might do differently in your own driving? What things might you remind yourself about in the future?
- How might some of your own habits or attitudes translate to driving a truck?

Factors that influence risk tolerance – with examples

Risk tolerance factor	Examples
1. Overestimating capability or experience: • You think you have more experience with a particular situation or vehicle than you do.	• Not slowing down on a gravel road. • My truck can fit under this bridge no problem.
2. Familiarity with the task, situation, or road: • You've done this/been here many times before. • You know what to expect/how to do it.	• Driving over the mountains in the winter. • Going fast on a familiar twisty road.
3. Seriousness or cost of the consequence: • You don't believe there could be a negative outcome from your actions. • Any potential costs to your actions seem negligible. • You likely won't get caught.	• Speeding – you believe they don't ticket for 10 over the speed limit • Drive contrary to licence restrictions. • Too many passengers for number of seatbelts, "only this once".

Risk tolerance factor	Examples
4. Personal experience with an outcome: • You've done it (something illegal or unsafe) many times before with no negative consequences. • You're unaware that it is a risk	• Texting, following too closely, speeding, heavy loose objects in the vehicle, loose dogs, riding a motorcycle in a t-shirt. • I can drive I have only had one drink.
5. Confidence in the vehicle, equipment or technology: • Your tires, power, ABS etc. will save the day. • You believe you are more protected than you really are.	• Late braking because you think the ABS lets you stop faster (not understanding the technology). • Passing others in the snow because your high-end winter tires are awesome. • Driving too fast around the curve based on the load in the vehicle (physics issue). • Riding your motorcycle faster, with more confidence when you have all the gear on.
6. Potential profit and gain from actions: • It is worth it because of time or dollar savings or other reasons.	• Overloading your truck so you only have to do one trip. • Delivery drivers driving fast and aggressively to get more done – make more money or get off shift sooner. • Speeding so you don't miss your flight.
7. Role models accepting risk: • People you respect do it. • Who are the role models in your life? Do they take/allow risks? What type?	• Coworkers do it this way – it's the way it's done. • The company expects it. It's the way I was taught. • Truckers tell each other that they make it up the hill without chains (when they should've been put on). • "What they see is what you get."
• Personal reflection: Is there something in your own driving that may be sending the wrong message on risk tolerance to people you care about?	

Defensive driving review quiz - answer key

1. What is meant by 'zone of awareness'? (A full 360° area around the vehicle as well as above and below the vehicle.)
2. What are the six basic driving conditions? (Driver, vehicle, light, weather, road, and traffic.) (6 marks)
3. What are the two categories of driver error? (Recognition errors and decision errors.) (2 marks)
4. Of the six conditions of driving, which is the most important condition and why? (Driver condition…that is the one we have control over.)
5. Why is it important to remove snow from windows and windshield wipers? (Snow and ice can fly off and damage other vehicle or cause a crash.)
6. What is hydroplaning? (On wet roads, your tires may lose contact with the road surface by floating on the water.)
7. Why make emergency plans when you see a hazard? (To react in time and in a safe and responsible manner.)

Handling emergencies

Unit overview

Part of MELT framework Module 3 - Driving techniques, Module 4 - Professional driving habits, and Module 6 - Documents regulations and planning.

Materials required

- Audio/visual equipment
- Whiteboard or flipchart and markers
- Slide presentation: Handling emergencies
- Student guide.

Time to complete this unit: 2.5 hours

Learning outcomes from MELT framework

3.2.4. Explains how to properly use emergency runaway lanes.

3.2.7. Explains the need to carry the emergency equipment required for certain commercial vehicle operations.

4.2. Handle emergency incidents in a professional manner.

4.2.1. Describes the typical incidents that must be reported to employers, police and other reporting agencies.

4.2.2. Describes the importance of following workplace practices, procedures and policies when engaging emergency support such as: towing, recovery and repair services, or when speaking with police, media, or the public.

4.2.3. Explains the importance of following the specific requirements of workplace practices, procedures and policies regarding collisions, close calls, injuries or other similar incidents.

4.2.4. Explains the importance of workplace practices, procedures and policies relating to obligations and limitations in administering first aid.

4.2.5. Explains what to do in the event of emergency situations, including:

- Ensuring no danger for the driver
- Loss of brakes / use of runaway lanes
- Skid, Jackknife
- Loss of visibility
- Vehicle malfunction
- Tire blowout or fire
- Brake fire
- Spill or loss of load
- When to call the fire department
- Driver medical distress.

4.2.6. Explains how and when to use emergency equipment carried in the vehicle such as: fire extinguisher, emergency warnings devices, spill kits, etc.

4.2.7. Uses warning devices and other emergency equipment safely and in compliance with regulations.

6.3.6. Explains the need to carry first aid supplies.

6.3.13. Properly wears or otherwise uses appropriate personal protective equipment.

6.3.14. Locates emergency contact information.

Introduction

Time required: 10 minutes

Slides 1 - 3

Slide 2 – Unit overview

The safest and best way to avoid an emergency is to prevent it from happening in the first place. However, no matter how safely they operate their tractor-trailer, there will always be a chance for an incident as long as there are variables that they have no control over such as weather, wildlife, and other drivers.

When the unexpected happens, drivers need to safely and legally deal with the situation in a calm and responsible manner.

Review the main topics for this unit.

Note: Throughout this unit provide examples of emergencies you, or others, have experienced with a truck.

Slide 3 - General emergency steps

Review the slide and include key points.

Key points:

- Quickly and calmly take the necessary actions to safeguard the vehicle and other motorists.
- If the vehicle can be moved, move it as far off the roadway as safely possible — this should not affect the police officer's investigation. This is especially important on busy or high-speed roads where it may be dangerous to leave vehicles in the driving lanes.
- It's important to follow workplace practices, procedures and policies when engaging emergency support such as towing, recovery and repair services, and when speaking with police, media, or the public.
- When you get hired, ask your employer for their procedures and policies if they don't train you in them.

- Following required procedures will help keep you safe and help protect you from liability in the event something goes wrong.

Emergency supplies

Time required: 15 minutes

Slides 4-6

Slide 4 – Emergency supplies – discussion group activity

Introduce the topic and explain the activity.

Emergency situations for commercial drivers often involve breakdowns, but there are also weather delays, road closures and even power outages.

Imagine you are in a crash or stranded for a day or two when the road gets closed due to avalanche…

In groups of 3-5, give students 5-10 minutes to brainstorm what emergency supplies they think they should have with them on the job.

After 5-10 minutes, bring the groups together and circle around to each group for one idea at a time until all ideas have been shared and discussed, as needed. Include when and why you might need them and how to use them, as appropriate.

Ideas may include:

- Approved warning devices
- Spill kits
- First aid supplies
- Fire extinguishers (legal requirement for DG)
- Personal protective equipment (PPE)
- Personal medical supplies
- Heavy-duty jumper cables
- Some basic tools (what might this include)
- An emergency kit with food and water for three days

- Flashlight and extra batteries
- Candles and matches
- Some cash
- Emergency contact numbers
- Extra clothes and blanket. Important during the winter months. Layers of clothes are better than a single heavy garment
- Food that doesn't require refrigeration or cooking to eat
- Can opener and eating utensils
- Paper towels and bathroom tissue
- Rubber gloves, or latex gloves to wear inside your regular gloves…keeps oil and fuel from causing skin irritation
- Antifreeze/coolant, oil, tire pressure gauge, DEF, windshield washer fluid
- Extra wiper blades. For the winter months, the heavy duty "winter" blades are better than regular blades for rain
- Shovel and broom - Keep snow away from the grill and headlight areas, downwind door and low mounted exhaust.

Other tips:

- In extreme cold - do not work up a sweat…this will freeze between your clothing and skin
- If you're stranded, stay with your vehicle; do not try to walk out for help. It is much easier for rescuers to find you within your vehicle.

Slides 5-6 – Warning devices

Pass around examples of warning devices to the class. Show how to put the triangles together.

Review the illustration of where to place the warning devices.

Emergency situations

Time required: 90 minutes

Getting stuck and mechanical failure

Slides 7 - 8

Getting stuck in snow, mud, or deep gravel

- Ideally, you should not get stuck in the first place.
- The best way to prevent getting stuck is by avoiding soft shoulders, deep snow, muddy roads and icy/slippery surfaces.

Ask – what can you do free your stuck vehicle? Review the steps to free a stuck vehicle.

Mechanical failure

Key points:

- If your truck does fail mechanically, there's no need for panic.
- Keep your wits about you. Breakdowns can happen in unsavoury places, be it in bad weather or in bad neighbourhoods.
- Making smart decisions can save your life.

Steps to follow in the event of a breakdown

- Activate the emergency hazard warning lights
- If possible, ease off the road and stop the vehicle in safe place
- Put out approved warning devices
- Tilting open the hood let's others know you are broken down
- Assess the problem
- Contact dispatch
- Stay in your truck if you feel unsafe.

Needing a tow

Key points:

- If towing is necessary, you're still responsible for your vehicle and cargo. You need to stay in charge and supervise the operation.
- Where are the tow hooks located on a truck?
- What information do you need to give the tow operator? (weight for example)

Tire failure

Discuss how it feels and what to do if a tire blows out:

- Front tractor tire
- Rear tractor tire
- Trailer tire

Personal medical distress

Ask: what would you do if you had a sudden medical issue?

Emergency braking and skids

Slides 9 – 15

Review these slides using questions to the students and discuss.

Slide 9 – ABS

Slide 10 – Threshold braking

Slide 11 - Skid avoidance and control

Slide 12 – Jackknife

Slide 13 – Trailer swing

Slide 14 – Tire failure

Slide 15 - Flooded roadway

Emergency actions

Slide 16 -19

Discuss these situations and what to do:

- Large animals on the road
- On coming vehicle in your lane
- Emergency actions to avoid a crash
- Gravel shoulder recovery.

Slide 20 - Loss of brakes

Activity - News story analysis

Put students in groups of 3-5 and have them read the news story on the Anarchist Mountain fire in their workbook. One student could volunteer to read it aloud. They should then discuss the following questions:

- What could've caused the brakes to overheat?
- What could've caused the rig to overturn?
- What were the consequences?
- How could this crash have been prevented?

When students are ready, have them share thoughts with the whole class and discuss. Then transition to discussing runaway lanes.

Slides 22 – 25 - Runaway lanes

Review the slides on runaway lanes and types of arrester beds.

- Gravity bed runaway lanes
- Arrester bed with gravel bed
- Arrester bed with cable nets.

Slide 26 – Loss of visibility what to do

Review visibility issues and discuss strategies:

- Headlights fail
- Mud, slush, snow on windshield
- Fog or whiteout
- Glare.

Slide 27 – Fire – common causes

Review the slide and discuss tips and procedures.

Slide 28 – Fire – what to do

When a fire occurs:

- Stop in a safe position away from buildings and other vehicles.
- If it is a combination unit, uncouple the unit when possible.
- Contact the fire department and tell them what type of material is burning.
- Based on the type of fire, take all possible steps to extinguish it.
- If the fire might be due to a short-circuit, remove battery cables if possible.
- If the cargo is of an explosive nature, stop traffic and warn people to stay back.
- If carrying live animals, release them if possible and safe.

Slide 29 - Fire extinguishers

Extinguisher operation - while you encounter many extinguisher types, they are all used in basically the same way.

The procedure is to:

- remove it from the bracket
- pull the safety pin by breaking the seal
- approach the fire from upwind if possible
- hold the extinguisher in an upright position
- point the discharge apparatus (hose, horn, nozzle) at the base of the fire, approximately two to three metres (six to eight feet) away. do not allow the flames to come between you and the exit
- squeeze the handle
- continue to use until fire is out and extinguisher is fully discharged
- ensure all discharged fire extinguishers are replaced with fully charged ones before the vehicle is used again.

Remember the word PASS

P – Pull the pin

A – Aim low

S – Squeeze lever

S – Sweep from side to side

Fire extinguishers expire six years from the manufacturer date (located on the bottom of the fire extinguisher) and require an annual re-certification, which includes a 14-point inspection.

Slide 30 - Forest fires

Within B.C., report grass, brush and forest fire sightings to:

1-800-663-5555

Cell: *5555

Crash and incident procedures

Time required: 15 minutes

Slide 31 – Crashes and incidents

Explain that in Canada, when you've been involved in a crash, or do something that causes a crash, you must stay at the scene and provide assistance and information.

Even if you were not involved, you should still stop and offer to help if the police or other emergency services has not yet arrived. You'd want others to do the same for you.

Slide 32 – Crash procedures activity

Discussion group activity.

Have students close their student guide.

Imagine you are in a crash or come upon the scene of a crash…

In groups of 3-5, give students 10-15 minutes to discuss the procedures they think they should take in the event of a crash.

After 10-15 minutes, bring the groups together and ask each group for one idea at a time until all ideas have been shared and discussed as needed.

After the discussion, refer to the handling emergencies section in the student guide to cover anything missed.

Slide 33 - Loss of load and spills

Discuss how to report a spill.

- Have students add the spill phone number to their contacts on their phone.
- Note: load securement will be covered in the unit on cargo.

Slide 34 – Legal reporting requirements

Review the legal reporting requirements.

Exchange information:

- Your name and address
- The name and address of the registered owner of the vehicle
- The licence plate number
- Insurance information

Report collisions to police if:

- Anyone has been injured or killed
- An impaired driver is suspected
- A hit and run has occurred
- It involves an out-of-province vehicle
- Vehicles need to be towed

Report a claim to ICBC online or by phone, 24 hours a day, seven days a week. Please provide the following when reporting a claim:

- The licence plate number of each vehicle involved
- Driver's licence number of each driver
- Insurance information for vehicles not insured by ICBC
- Police file number (if applicable and available)

Slide 35 – Near misses

Discuss the importance of reporting near misses.

- History has shown repeatedly that most serious and catastrophic events, were preceded by warnings or near miss incidents.
- Recognizing and reporting near miss incidents can significantly improve worker safety and enhance an organization's safety culture.

Practical training connection

Learning about risks and consequences, how to avoid or handle critical incidents, and developing a safe driving approach to commercial driving is a key element of this program and should be woven throughout training.

- Share your experiences involving emergencies at appropriate times during training.
- Discuss any emergency situations observed or experienced during on-road training.
- Demonstrate and have students practice deploying warning devices.
- Wear and have students wear appropriate protective equipment, as needed.
- Have students locate and check emergency equipment in and on the vehicle.

References

National Safety Council, Near Miss Reporting Systems, PDF:

https://www.nsc.org/Portals/0/Documents/WorkplaceTrainingDocuments/Near-Miss-Reporting-Systems.pdf

Handling emergencies review quiz – answer key

1. In the event of a crash, list six reason when are you required to immediately contact police?

    - Injury
    - Death
    - Impaired driver
    - Hit and run
    - Out of province vehicle
    - If a vehicle needs to be towed

2. Where should your warning devices be placed? (two marks – any three of)

    - In line with the vehicle
    - 30 metres (100 ft.)
    - In front and rear

3. When visibility is reduced to 150 metres, what should the distance to warning devices be? (75 metres / 245 ft.)

4. Regarding fire extinguishers, what does PASS stand for?

    - Pull the pin
    - Aim low
    - Squeeze lever
    - Sweep from side to side

5. If you have a near miss should you report this to your company? (Yes).

6. List four emergency supplies to carry with you. (Any of: approved warning device, first aid kit, spill kit, flashlight, emergency contact number, personal medial supplies, fire extinguisher, water, food

7. List four emergencies that may occur while you are on the road. (Any of: hitting wildlife, breakdown, crash, personal medical distress, tire failure, natural disaster i.e. flood, wildfire, weather)

8. List two things that could result in brake failure. (Poor slack adjustment, too fast downhill – heat, worn brake pads/shoes)

9. List at least two things that could reduce your visibility. (Fog, snow, rain, nighttime, poor wiper blades, being tired)

10. List four types of surfaces to try to avoid in order to prevent getting stuck. (Soft shoulders, deep snow, muddy roads and slippery surfaces.)

11. If you need to have your truck towed, who is responsible for the cargo? (The driver)

12. List four pieces of information that must be exchanged with the other driver(s) if you are involved in a crash.

- Your name and address
- The name and address of the registered owner of the vehicle
- The licence plate number
- Insurance information.

Documents and regulatory requirements

Unit overview

This unit will introduce students to the various government laws, regulations and standards, including documentation, that govern the trucking industry.

This section is broken into several sections that can be taught at a time that suits your course. Learning outcomes are found in each section.

Part of MELT framework Module 1: Overview of the trucking industry, Module 3: Driving techniques, and Module 6: Documents, regulations and planning.

Time required: 2.5 hours in the classroom

Materials

- Student workbook
- Sample commercial vehicle related documents.
- Note: no slide presentation has been provided for this lesson.

Learning outcomes are found in each section.

Introduction to commercial laws and regulations

Time required: 30 minutes

Learning outcomes from the MELT framework

1.4. Explain the purpose, structure and basic content of regulations that apply to commercial vehicle operations.

1.4.7. Explains the role of regulations and training in crash prevention.

1.4.8. Describes the National Safety Code as a model for Canadian jurisdictions to regulate the safe operation of commercial vehicles.

1.4.9. Explains that legislation and regulations may affect operations within each jurisdiction, and that applicable rules can vary, even during the same workday, depending on where a driver is working.

1.4.10. Explains that regulations apply to the:

- movement of vehicles on all public roads and highways
- mechanical condition of commercial vehicles
- securing of cargo transported by commercial vehicles
- daily inspection of commercial vehicles
- transport of materials and products that are defined as dangerous goods, and
- hours a person is permitted to drive a commercial vehicle, be on-duty, and be off-duty.

3.2. Comply with operational regulations that apply to commercial vehicles.

3.2.11. Explains the regulation and procedures for a “notice and order”.

Why do we have laws and regulations?

Explain that over the years, regulations have worked hard to educate drivers about safe driving and to reduce the number of crashes and fatalities on our roads.

Activity - video

Video shows a driver on phone before fatal crash
https://www.youtube.com/watch?v=sGH--rW6UD0 (2:33)

Discussion

- Why do we have laws, rules and regulations?
- Why do people not always follow the rules?
- What are some of the consequences of not following rules?
- Can they think of a time when they, or something they know did not follow rules with terrible consequences? All students to share their stories.

Key points:

- Trucking regulations help govern transport across over one million kilometres of Canadian highways
- As a professional driver, you'll be expected to know and understand the laws and regulations governing the profession
- Carriers operating into the USA must adhere to both Canadian and American requirements and regulations.

Let's take a look at some of the laws and regulations…

National Safety Code

Key points:

- The goal of the NSC is to improve road safety and consistency of regulations across Canada and to help ensure that the transportation industry remains viable and sustainable
- Division 37 of the Motor Vehicle Act Regulations (MVAR) is the Safety Code in B.C.
- It also includes the laws that regulate hours of service, trip inspections and audits
- The regulations in Division 37 are administered under the name, ***The National Safety Code***. There are 16 standards.

Refer to the 11 standards specific to commercial drivers listed in the student guide and briefly review.

Motor Vehicle Act (MVA)

Key points:

- Provincial legislation that governs the operation of motor vehicles on public roadways. It includes regulations about:
- Driver licensing
- Hand-held electronic communications equipment
- Traffic control devices
- Vehicle equipment
- Traffic laws.

Other Canadian jurisdictions have their laws regarding operation of vehicles on public roadways. Individual municipalities in B.C. may also have traffic by-laws.

It is your responsibility as a driver to be aware of by-laws and other regulations in other Canadian jurisdictions before traveling outside the province or out of your municipality.

Violation of these laws and regulation may result in various consequences. Under these laws and regulations, some infractions can lead to a criminal conviction.

Criminal Code of Canada

Key points:

The Criminal Code of Canada provides judiciary consistency across Canada. Conviction of an infraction will result in a criminal record.

Examples of infractions that can lead to a criminal conviction include:

- Impaired driving
- Any existence of a blood alcohol level
- Combination of drug or drug-alcohol use
- Leaving the scene of an accident
- Failure to provide a breath or blood sample
- Dangerous driving causing bodily harm or death
- Driving while suspended, prohibited or otherwise disqualified.

More information about impaired driving is provided in the lesson on impaired and distracted driving.

Consequences of traffic convictions

Key points:

Traffic convictions and incidents added to your driving history may appear on your personal and NSC commercial driving abstract. These may affect the status of your driver's licence as well as your ability to operate a commercial vehicle.

Some of the consequences of traffic convictions may include one or a combination of the following:

- **Fines** - a driver may receive fines for traffic violation. Amount of fine varies with the gravity of the traffic violation.
- **Penalty point premium (DPP)** – points are recorded against your driving record when you are convicted of an offence. You are convicted when you:
    - Pay the fine assessed on your ticket voluntarily
    - Automatically after 30 days if the fine is not paid or disputed
    - Appear in a court and are found guilty
    - Fail to appear in a court and are convicted (guilty) in absence.
- **Driver risk premium (DRP**) – ICBC views your driving record for the previous three years. You are invoiced once a year for the previous three year period. DRP is separate from Autoplan insurance premiums. You're billed even if you don't own or insure a vehicle.
- The table in the Student Guide shows the DRP amounts a person would have to pay for one or more offences.
- **Driver's licence suspension or prohibition** - driving privileges can be suspended immediately for various reasons.
- **Jail time** - if you are found guilty under the *Criminal Code of Canada* to cause bodily harm or death while impaired, you may face a time in jail.
- **Criminal record** - criminal convictions may affect an individual's employment status and/or future employment opportunities. The employer may require employees and job applicants to disclose criminal record history in order to maintain their jobs or prior to employing new employees.
- **Insurance cost** - drivers with records featuring a history of traffic convictions and incidents may be considered a higher risk job candidate by employers

- **Travel restrictions** - individuals with criminal history may be refused entry into some countries.
- **Loss of employment –** individuals may be required to disclose criminal convictions as a condition of their employment. Driving related convictions may result in suspensions. Employers may terminate employees convicted of *Criminal Code of Canada* offences, whether or not the employee loses their licence.

Documentation requirements

Time required: 30 minutes

Documentation introduction

For truck drivers, paperwork is an integral part of the job. Watch the video for an overview.

Activity – video

This video briefly discusses resume and cover letters, bills of lading, log sheets, customs documentation, trip sheet, incident/collision reports, and receipts, documents for weigh scale.

Paperwork | CDL Drivers - Truck & Bus (9:53)

https://www.youtube.com/watch?v=37ocgF-6LgQ

Driver's documents and regulations

Time required: 10 minutes

Drivers may be asked by authorities to produce any of the following:

- Driver's licence
- Medical services card
- Passport or FAST (Free and secure trade) card for border crossings
- Logbooks.

Key points:

- Driver's licence - A driver must be licenced for the class and type of vehicle they are operating. A Class 1 driver with an air brakes endorsement may operate semi-trailer trucks and all other motor vehicles or combinations of vehicles except motorcycles

- Your valid B.C. commercial driver's licence is your proof of medical certification
- **Code W** is an identifier placed on the front of a commercial driver's licence, to indicate that the operator has a medical condition that prohibits the operation of a commercial vehicle in the United States
- Drivers have the option of including their medical services card number on their driver's licence.

Valid passport or FAST

Key points:

- Drivers need a valid passport or FAST (Free and Secure Trade) card for border crossings into the U.S. and Mexico
- To apply for a FAST card visit the Trusted Travelers Program through the U.S. Department of Homeland Security website
- Your employer should provide training and instructions for border crossings.

Logbooks

Key points:

- This regulation applies generally to buses and to vehicles having a gross weight of 11,794 kg or more and includes some exemptions for certain vehicles and activities
- Drivers are required to keep a daily log of their hours

Details will be covered in the ***Hours of Service*** unit.

Vehicle documents and regulations

Vehicle and load documents

Key points:

Drivers may be asked by authorities to produce any of the following:

- Vehicle licence, registration and insurance
- Lease/rental agreements
- Safety fitness certificate
- Operating authority certificate
- Dangerous goods documentation (if applicable)
- Commercial vehicle inspection certificate and sticker
- Permits
- Driver's vehicle inspection schedule and report
- Route/passenger information
- Shipping documentation.

Vehicle licence, registration and insurance

Key points:

- Carriers must ensure that their vehicles are registered, insured, have the appropriate vehicle plate class, and have the appropriate permits and certification to operate
- A carrier must ensure that they meet the insurance requirements for their operation
- If you are paid to transport goods, you must carry cargo insurance. The amount of insurance you must carry depends on how much weight your vehicle is licensed to carry
- Further, insurance coverage requirements may include public liability and property damage insurance.

Safety fitness certificate (SFC)

Key points:

- There is both provincial and federal NSC legislation that may require a carrier to obtain a ***Safety Fitness Certificate (SFC)***
- Federal law applies to carriers operating outside of B.C.
- It requires carriers to obtain a SFC if they operate:
  - A truck, tractor, or trailer, or any combination of these vehicles registered for or weighing in excess of 4,500 kilograms, or
  - A commercial passenger vehicle with an original manufacturer's seating capacity of 11 or more persons including the driver.
- Provincial law applies to carriers operating solely within B.C. and requires carriers to obtain a SFC if they operate:
  - A truck, tractor, or trailer or any combination of these vehicles registered for a weight of 11,794 kilograms or greater, or
  - A commercial passenger vehicle with an original manufacturer's seating capacity of 11 or more persons including the driver.
- In B.C., you must have a SFC before you can licence a commercial vehicle
- Original or copy of the certificate must be carried in the vehicle
- Name of the NSC holder must be displayed on the outside of the commercial vehicle.

Commercial vehicle inspection program (CVIP)

Key points:

- Illegal for a commercial vehicle to be operated unless it has a valid inspection certificate and decal
- Inspections must be conducted in a government licenced facility by a licenced technician
- Vehicles registered for a weight of 11,794 kg or more and a combination of vehicles which add up to a registered weight of

11,794 kg or more (including trailers) must be inspected under the CVIP once every 6 months

- Driver must be able to produce the inspection certificate on the request of an investigator or police officer.

International Registration Plan (IRP)

Key points:

- An agreement between the United States and Canada that allows for the sharing of commercial vehicle registration fees
- Created to encourage the fullest possible use of the highway system between member provinces, territories and states
- Federal carriers operating B.C.-plated vehicles can apply through ***Prorate Services*** for vehicle registration in other provinces or states. The B.C. government will issue a ***Cab Card*** for each vehicle the carrier operates
- An IRP registration does NOT:
  - Exempt a carrier from paying motor fuel taxes in any province or state
  - Exempt a carrier from obtaining an Operating Authority Certificate and/or a SFC
  - Allow a carrier to operate outside of B.C. with a Provincial Operating Status
  - Allow a carrier to exceed maximum height, length, width and axle limitations.

For more information see the ***British Columbia IRP Manual*** available at ICBC.com.

International Fuel Tax Agreement (IFTA)

Key points:

- An agreement between the U.S. and Canada that allows federal carriers to operate in more than one location
- Created to make it easier for carriers to register, licence, report and pay taxes for motor fuels (such as diesel and gasoline)

- Fuel Tax reporting is required from all intra-jurisdictional trucking firms that travel in B.C. with commercial motor vehicles that have a gross vehicle weight of 11,797 kilograms or more
- Intra-jurisdictional trucking firms must apply for an International Fuel Tax Agreement (IFTA) licence to report and account for Fuel Tax payable and distances travelled in each jurisdiction in which they operate
- You must keep a careful record of your fuel receipts, log reports and trip reports.

Vehicle inspection and maintenance

Key points:

- This regulation ensures that only vehicles that are safe to operate can continue operating on BC's roads
- Achieved through:
  - designating certain vehicles as salvage vehicles
  - regulating the sale of salvage,
  - out-of-province and used vehicles, and
  - creating a comprehensive vehicle inspection program.
- Requires vehicle inspection facilities and technicians to be licensed and to adhere to strict standards

Detailed information about vehicle inspections will be covered in the *Vehicle inspection* unit.

Driver's vehicle inspection report (DVIR)

Key points:

- A driver is required to carry an inspection schedule and report the vehicle
- All commercial vehicles (trucks/power units) with a registered gross vehicle weight of 11,794 kg or more, buses with a seating capacity of more than 10 people, and any trailers or semi-trailers being towed, must be inspected by the driver or a qualified person once in every 24-hour period while the vehicle is in use

- It's an offence to drive, or permit a person to drive, a vehicle on a highway if any vehicle part (or equipment) is defective or inoperative

Detailed information on this report will be covered in the *Vehicle inspection* unit.

Preventative maintenance program

Key points:

- To ensure all commercial vehicles are subject to a systematic, regular preventative maintenance program
- Ensures small problems can be corrected before they result in collisions or incidents, major repairs or a vehicle breakdown
- Generally expected that the maintenance program will follow the recommendations of the vehicle manufacturer for maintenance and repair
- Motor carriers must also ensure that each vehicle is repaired in the event of a recall notice being issued by *Transport Canada* and proof of that repair must be carried in the vehicle maintenance file
- Records of inspection, maintenance and repair must be kept for the last three years of ownership and six months after the vehicle has been sold.

Notice and orders

Review the notice and order information in the Student Guide.

Shipping documents

Time required: 20 minutes

Materials

- Blank bills of lading and waybills.

Learning outcomes from the framework

6.1. Administer workplace documents and communicate effectively through written and electronic means.

6.1.1. Identifies and describes the meaning of messages and symbols on cargo packaging and cargo documents such as waybills, packing lists, delivery documents, instructions, workplace hazard information, etc.

6.1.2. Identifies and describes the basic purpose, importance and proper condition of required vehicle related documents.

6.1.4. Legibly records some basic information onto cargo-related documents such as waybills.

Overview of shipping documents

Key points:

- Provides accurate record of the cargo and may serve as a contract for transport services.
- Types of shipping/cargo documents:
  - Bills of lading
  - Waybills
  - Weigh slips
  - Cargo packaging
  - Delivery instructions.

Bill of lading and condition of carriage regulation

Key points:

- This regulation applies to goods transported by commercial vehicles on B.C. roads
- Sets out the specific information that must be included in bills of lading and waybills
- Specific reporting requirements apply to certain types of goods being transported, for example to livestock and household goods
- Conditions of carriage are also set out in the regulation's schedules.

Bills of lading

Key points:

- A legally binding document providing the driver and the carrier all the details needed to process the freight shipment and invoice it correctly
- A bill of lading must be completed and provided to the shipper when your freight is to be picked up. Must include the following:
  - name and address of the shipper
  - date of the shipment
  - originating point of shipment
  - name of originating carrier
  - names of connecting carriers, if any
  - name and address of the receiver
  - where the shipment is going (if different from address of receiver)
  - weight, description and particulars of the goods in shipment.

Activity

Provide a blank bill of lading and have students complete it using the following information:

- Dispatch shipper: Penny's Peppers
- Amount: 110 boxes
- Pallet: 1 pallet (10 boxes x 11 floors = 110 boxes pallet)
- Boxes dimension each: 40X30X20
- Weight: Each box weighs 5kg
- Location: 2727 Westham Island Rd, Delta, BC V4K 3N2, Canada
- Pick up date/time: Monday at 7am
- Consignee: Freddy's Farm Market.

Waybills

Discuss waybills and other miscellaneous documentation.

Key points:

- Instead of a bill of lading, the company may carry a waybill for the goods issued by the consignor or carrier.
- Has the following information:
  - Particulars of the goods carried on the vehicle
  - Name and mailing address of the consignor
  - Point of origin of the shipment
  - Name and mailing address of the consignee
  - Destination of the shipment
  - Names of connecting carriers, if any
  - Whether the charges are prepaid or collect
  - Date of the consignment.

Transporting dangerous goods

Time required: 15 minutes

Part of MELT framework Module 1, Overview of the trucking industry.

This lesson is brief overview of dangerous goods and doesn't replace a dangerous goods course.

References:

Student Guide:

- Transporting dangerous goods
- Hazard classes and divisions
- Identification of dangerous goods.

BC Government website:

https://www2.gov.bc.ca/gov/content/transportation/vehicle-safety-enforcement/information-education/transporting-dangerous-goods

Learning outcomes from the framework

1.4. Explain the purpose, structure and basic content of regulations that apply to commercial vehicle operations.

1.4.13. Explains that some cargo is defined through regulations as dangerous goods.

1.4.14. Explains that dangerous goods can only be handled and transported by workers who have been specifically trained and certified.

1.4.15. Identifies the types of symbols used to identify dangerous goods.

Dangerous goods requirements

Key points:

- A product, substance or organism included by its nature or by the regulations in any of the classes listed in the schedule.
- Transportation of some goods could pose significant danger if they are not properly secured or contained during transporting.
- Can be solid, liquid or gaseous form and can harm people, other living organisms, property or the environment. Proper caution must be taken when handling and transporting dangerous goods.
- The law - no one shall handle, offer for transport or transport dangerous goods unless they are trained or they work in direct contact with someone who is trained.
- Carriers are responsible to make sure their employees have the proper training to work safely with dangerous goods. A driver may have several dangerous goods cards.
- Discuss the risks of being given a load containing dangerous goods before receiving training.
- Drivers who transport dangerous goods in B.C. must comply with provincial and federal standards:
- Dangerous goods shipping documents must be carried within the driver’s reach. When the driver leaves the cab, the dangerous goods shipping documents must be left in an obvious place in the cab – either on the seat or in the pocket in the driver’s door.

Classes of dangerous goods and placards

Review the hazard class definitions and the dangerous goods labels and placards charts in the Student Guide.

Students do not need to memorize all the details of these placards but should be familiar with them.

Key points:

- Placards are clear indicators that the transport unit contains larger amounts of dangerous goods
- When a collision or spill occurs, these placards alert responders to the presence and nature of the dangerous goods. This allows them to take the correct actions
- The consignor is responsible for providing the placards to the carrier before allowing a carrier to take possession of dangerous goods for transport in a large means of containment on the vehicle
- It is a carrier's responsibility to make sure a vehicle has all the proper placards on it before it is loaded
- Drivers must place the placards on each side and each end of the vehicle so anyone looking at the vehicle from any angle will be able to see the signs
- In the event of an emergency involving dangerous goods, call CANTUTEC at 1-888-226-8832, 613-996-6666 or *666 on a cell phone.

Vehicle weights and dimensions

Time required: 45 minutes

Part of the following three framework modules:

- Overview of the trucking industry
- Driving techniques
- Documents, regulations and planning.

Reference Student Guide sections:

- Maximum vehicle weights
- Vehicle dimensions and special permits.

Learning outcomes from the framework

1.4. Explain the purpose, structure and basic content of regulations that apply to commercial vehicle operations.

1.4.10. Explains that regulations apply to the allowable weights and dimensions of commercial vehicles.

1.4.11. Explains that commercial vehicles are generally defined by weight and that individual Canadian jurisdictions can set unique weight thresholds.

1.4.12. Explains that commercial vehicles may be restricted from operating on certain routes, or at particular times, due to their weight, licence, size or the commodity being transported.

3.2. Comply with operational regulations that apply to commercial vehicles.

3.2.1. Explains the need to know the height of their vehicle before driving on any road and how to determine the height.

3.2.2. Explains the need to know the approximate empty and loaded weight of their vehicle before driving on any road.

3.2.6. Explains standard highway height and weight limits and restrictions.

3.2.8. Explains the importance of immediately recognizing and responding to an unexpected situation in which their vehicle weight or

height is greater than what is permitted to operate on a particular road or highway.

3.2.17. Watches for potential hazards of unmarked overhead obstructions such as: canopies, roof overhangs and other building protrusions, signs, utility lines, tree limbs, doorway entries, etc.

3.2.18. Watches for snow build-up, debris or road construction that can change vehicle height, weight or clearances.

3.2.19. Identifies and reads all road signs indicating the weight capacity of roadways or bridges — including seasonal weight restrictions.

6.1. Administer workplace documents and communicate effectively through written and electronic means.

6.1.3. Accesses information and reference tables such as those related to vehicle weights and dimensions.

6.2. Complete basic mathematical calculations required for commercial vehicle operation.

6.2.4. Calculates actual and allowable axle weights.

6.2.5. Determines vehicle dimensions and axle spacing requirements, and complete calculations to confirm compliance with vehicle requirements such as "bridge formulas", etc.

6.2.7. Estimates and records cargo weight.

Ideas for teaching vehicle weights and dimensions

Create load distribution exercises. Student determine where they would place the items to achieve correct axle weights including doing the appropriate calculations

Teach weight and dimensions as part of, or immediately after, the load securement lesson. Then follow with a lesson on sliding the 5th wheel and sliding the trailer axles. This approach will tie all of the learning together.

Introduction

Key points:

- Maximum weight standards have been established by jurisdictions to ensure public safety and the protect infrastructure. In B.C., the type of vehicle, the number of axles, the manufacturer's rating, and the tire size can all impact the legal weight
- A driver must be aware of the actual size of their vehicle and load as maximum dimensions apply. If a vehicle or its load is too tall or too wide, it may not be able to travel on certain routes.

Show video – Boxtruck crashes into a 11 foot 8" bridge and then hits another low bridge (1:12)

https://www.youtube.com/watch?v=D7fvQVPS0JM

- Stress the importance of professional drivers knowing the height of their rigs and being able to estimate overhead clearance
- Point out to the students that a high crown on a road can cause a rig to tilt toward the side of the road, thereby causing the rig to hit structures near the side of the road.

Ask these questions to elicit discussion:

- What should a driver do before entering a narrow bridge from a curved approach?
- Why is personal observation and evaluation often more valuable than relying on posted heights?
- What are some conditions that can cause posted heights to be inaccurate?
- Can the weight of a vehicle affect the height of the vehicle? How?
- What precautions should a professional driver take on a return trip if the weight of the rig has changed?

Using information in the student guide and your own research and experience, create discussions and activities that address the learning outcomes in this unit.

Documents and regulations review quiz - answer key

1. Who is responsible to ensure the vehicle registration and insurance is proper? (carrier/owner)

2. List three vehicle documents you need to have with you when staying within Canada? (Insurance papers, driver's vehicle inspection report, trip report).

3. List four shipping documents must be carried within the driver's reach? (Bills of lading, waybills, dangerous goods shipping documents, weigh slips, cargo packaging, delivery instructions) (2 marks)

4. Who is responsible for making sure the proper permits are obtained for the shipment? (the carrier/owner)

5. What is the maximum height allowed for a commercial vehicle? (4.15 m / 13' 7")

6. List four different overhead obstructions a driver must watch for. (Canopies, roof overhangs, other building protrusions, signs, utility lines, tree limbs, doorway entries.) (2 marks)

7. What is the maximum legal width allowed for a vehicle without needing a special permit? (2.6 m or 8'6")

8. What is the maximum length allowed for the following commercial vehicles? (Single vehicle: 12.5 metres /41' 0", truck-tractor with single or tandem axle and semi-trailer: 23.0 metres / 75' 6")

9. What is the best way to determine a vehicles exact dimensions? (Visit the nearest weigh scale)

10. Why is it critically important for a driver to know the exact height, width and weight of their vehicle? (If it's too wide or tall it may not be able to travel on certain roads, if it is too heavy, it may not be able to travel on certain roads due to seasonal or other weight restrictions. Certain bridges may not be rated for the weight and could collapse.)

11. What must a driver do before carrying dangerous goods? (Be trained or work directly with someone who is).

12. List three examples of dangerous goods. (See student guide for multiple options)

Violation scenarios

Time required: varies

Scenarios can be used in a variety of ways in the course. Here are three ideas.

- In small groups have students discuss the scenarios in class. Then report back to the larger group for discussion.
- Have students review the scenarios on their own time, answer the questions and come prepared to discuss in class.
- Use the scenarios as examples at appropriate times during the course.

Violation scenarios answer keys

Scenario one – tossing a cigarette

What was the offence that led to the fine?

- Under the Wildfire Act for dropping a burning substance.

What mistake did the driver make?

- Tossing a cigarette out the window and potentially causing a wildfire.

Scenario two – loss of toxic load

What was the offence that led to the fine?

- The discharge of a contaminant into the natural environment that was likely to cause an adverse effect.

What mistake did the driver make?

- Not checking to ensure the load was secured before closing the trailer doors.

Scenario three – distracted driving and other violations (Humbolt)

What was the offence that led to the fine?

- Not stopping at a stop sign.

What mistakes did the driver make?

- Failing to keep a daily drivers log, neglecting to comply with safety regulations, having more than one daily logbook, and not having or following a written safety program
- The driver should have
    - had a daily log current to the last change in duty status copies of the driver's daily log for the previous 7, 8 or 14 day period, to go with the driving cycle being used
    - had all supporting document issued en-route, such as bills of lading, shipping documents, fuel receipts and accommodation receipts for expenses
    - Secured the load to prevent distractions.

Scenario four – driver gets stuck under overpass

What was the offence that led to the fine?

- Driving without reasonable consideration since the route was closed to commercial vehicles.

What mistake did the driver make?

- The truck driver should have followed pre-approved trip routes and obeyed route closures.

Scenario five – use of cell phone – distracted driving

What was the offence that led to the driver being fired?

- Distracted driving. The fine for a distracted driving ticket is $368, along with four driver penalty points that will be applied to the driver's record.
- First-time violators must pay an extra ICBC penalty fee of $210 for a total of $578.

What mistake did the driver make?

- Under the Motor Vehicle Act, a driver is prohibited from holding, viewing, using or manipulating electronic communications equipment while driving a motor vehicle on a highway.
- Drivers can use their cell phone in their vehicle if they are legally parked off the road.
- They can also use it if they are using the "hands-free" function, but the device must be mounted to the vehicle using a cell phone holder or other mechanism.

References

Route maps for commercial vehicles in B.C.

https://www2.gov.bc.ca/gov/content/transportation/vehicle-safety-enforcement/services/permitting/route-maps

Heavy haul overweight guidelines and permits, and extraordinary loads.

https://www2.gov.bc.ca/assets/gov/driving-and-transportation/cvse/commercial-transportation-manual/chapter-6.pdf

Commercial transport regulations, Division 7.

https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/30_78#section7.02

Specialized vehicle size and weight guidelines and permits.

https://www2.gov.bc.ca/assets/gov/driving-and-transportation/cvse/commercial-transportation-manual/chapter-5.pdf

Height Clearance Tool: this uses Google Maps technology to generate the shortest route between two points. It will display conflicts for structures on that route which have any known restriction less than the height and/or width entered.

https://www.drivebc.ca/cvrp/index.html

Scale locations, hours of service and contact information.

https://www.th.gov.bc.ca/cvse/inspection_stations.htm

International registration plan (IRP) manual.

https://www.icbc.com/vehicle-registration/licence-plates/Documents/bc-irp-manual.pdf

Federal Government – transportation of dangerous goods program.

https://www.tc.gc.ca/eng/tdg/safety-menu.htm

B.C. Government – transportation of dangerous goods information.

https://www2.gov.bc.ca/gov/content/transportation/vehicle-safety-enforcement/information-education/transporting-dangerous-goods

Trip planning

Unit overview

Emphasize that a well-planned trip is the best insurance against having problems. Also stress the need to know company policy when planning trip so this can be factored into each trip.

Part of MELT framework Module 6: Documents, regulations and planning.

This lesson builds on previously learned content therefore has the following prerequisite lessons:

- Fuel efficient driving
- Documents and regulatory requirements
- Hours of service.

Required time – 2.5 hours.

Learning outcomes from the framework

6.2. Complete basic mathematical calculations required for commercial vehicle operation.

6.2.1. Converts simple imperial and metric measurements using tables, mathematical formulas, or conversion programs.

6.2.2. Calculates route and trip distances.

6.2.3. Estimates fuel consumption rates, and estimate how far a vehicle can travel on a particular quantity of fuel.

6.3. Plan ahead and anticipate problems.

6.2.6. Calculates trip durations to determine arrival times and plans departure times.

6.3.1. Explains the risk of traveling to an unfamiliar location without first confirming facilities and preferred routes.

6.3.2. Identifies some special requirements relating to a vehicle, load, routing or commodity.

6.3.3. Identifies sources of reliable information about weather and road conditions.

6.3.4. Describes the need to carry required emergency equipment on or inside the vehicle.

6.3.8. Accesses sources of maps and electronic route information.

6.3.9. Accesses sources of information about commercial vehicle routes, road construction, road closures, height clearances, weight restrictions, permit requirements, etc.

6.3.10. Prepares a route plan that considers vehicle size and weight.

6.3.12. Locate emergency contact information.

Materials required

- Local and provincial maps
- Audio/visual equipment
- Slide presentation
- Access to smart phones or computers for research activities.

Videos

Tips for a 26 hour trip – Red Viking Trucker – USA (5:27)
https://www.youtube.com/watch?v=g39vn8FNHDI

Unit introduction

Time required: 5 minutes

Slides 1 - 4

Introduce the importance of trip planning:

- Essential for safe and responsible operation of a commercial vehicle
- Essential for time management
- Helps to reduce driver stress and costs
- Ensures that the vehicle can be operated legally on specific roads.

Key points:

- You may be given a designated route, but ultimately it is the driver's responsibility to plan the trip
- You may discover a more efficient route than the dispatcher knows, or be aware of changes that need to be made to designated routes
- Communication between the driver and dispatch is vital in ensuring a successful trip
- In addition to route information that may be provided by the carrier, navigation tools can assist with trip planning including a number of GPS/Map Applications
- Only use devices according to the jurisdictional regulations
- A carrier may provide the driver with designated route information, or the driver may be required to do the planning.

Before moving on to the next slide have students brainstorm: *What things do you need to consider when planning your trip?*

Answers may include:

Travel distance

Departure and arrival times

Pick up or drop off appointment times

Breaks – to rest, eat, stretch

Scale locations

Traffic delays – rush hour, construction

Vehicle dimensions

Loading zones

Ferry schedules

Fuel costs and other expenses

Terrain – mountain vs. prairie, urban vs. rural

Restricted routes

Type of load

Low or narrow clearances

Weather conditions

Border crossings

Documents – permits

Emergency information and equipment.

Trip planning steps

Time required: 15 minutes

Slides 5 - 7

Slide 5 - Trip planning steps

Discuss trip planning steps. Why is planning important? What else should be considered?

- Ensure that documentation is current and correct. Ask students: What was the documentation discussed in the documents and regulatory requirements lesson? (driver, cargo, vehicle)
- Discuss the importance of having emergency contact information available
- Plan the route considering restrictions, traffic, weather, inspection station locations
- Estimate travel time and plan for food and rest stops considering hours of service requirements, pick-up and delivery times, and borders/ferries, if applicable
- Estimate need for fuel and plan fuel stops
- Estimate travel expenses.

Slide 6 - Video - Trip planning tips

Tips for a 26 hour trip – Red Viking Trucker – USA (5:27)

https://www.youtube.com/watch?v=g39vn8FNHDI

Key points from the video:

- Did three 9-hour days
- Major cities – hit before or after rush hour
- Shut down within 1.5 of drive time left to not push it and get a good parking spot
- Dropped load and picked up 2nd load
- 1560 mile run (2510 km).

Slide 7 - Confirm pickup and delivery times

Key points:

- Driver's responsibility to confirm pickup and delivery times with shippers and receivers
- It is especially important to make sure you have the correct time for your receiving appointments
- Find out if there are any delivery restrictions, such as non-acceptance on weekends that could cause costly stops or layovers
- Keep in touch with your dispatcher throughout the trip. They must be informed whenever a change to the route or a delay.

Road restrictions

Time required: 10 minutes

Slide 8

Discussion

- To protect the roadway, the B.C. Ministry of Transportation and Infrastructure has in place a **Seasonal Strength Loss Program** for heavy vehicles and commercial transport trucks on B.C. Highways.
- This program identifies and imposes load restrictions on roads, or portions of roads that have been weakened by excess water in the road base.
- All overload permits on restricted routes are invalid for the duration of these restrictions. Operators that violate a posted road restriction can be fined $345.

Activity

Click on the map to go to the B.C. Gov load restrictions website. Select a number of areas and read the notices.

https://www.th.gov.bc.ca/bchighways/loadrestrictions/loadrestrictions.htm

Ports of entry

Time required: 5 minutes

Slide 9 - 10

Briefly discuss driving into the U.S. Drivers should receive training from the carrier on company procedures.

- Drivers must stop and prove that the carrier has authority to operate in the jurisdiction
- Inspections and weighing may take place. Drivers must follow directions and ensure that they are carrying all required documents.
- To cross into the United States…

Personnel

- Must be eligible to legally enter the United States
- Must be minimum 21 years of age
- Carry proof of citizenship – passport, FAST card and VISA, if required
- Participate in a controlled substance testing program.

Vehicle

- Vehicle registration
- US DOT number and operating authority
- US Border Crossing Permit or submit border crossing fee.

Cargo

- Pre-arrival Notification under Automated Commercial Environment (ACE)
- Depending on the cargo type, other government department approval or pre-notification may be required, e.g. FAA for agriculture shipments.

Scenario assignments

Time required: 5 minutes

Slide 11

Have students form pairs or small groups (maximum of four students)

Assign, or have them choose, a one day trip scenario

Explain that they will work together to plan the trip through a series of activities during this unit

Once each group has chosen a scenario, move on to travel information.

Route scenarios

Create a number of trip scenarios to assign to students based on where you're located and where they may likely travel.

Scenario example

Shipper: Penny's Peppers
Location: 2727 Westham Island Rd, Delta, BC

Pick up date/time: Monday at 7am

Consignee: Freddy's Farm Market
8310 2nd Ave, Osoyoos, BC
Delivery date/time: Monday by 3pm

Road and weather information

Time required: 45 minutes

Slides 12 - 13

Slide 12 - Travel information

Review where to find road and weather information.

- Talk to other truck drivers about restricted access
- Cell phone, GPS or computer for route information and suggestions
- Ask the shipper or receiver for the best local route to get to your destination
- Listen to local radio for updates about traffic, incidents, and weather. In the Vancouver area, AM 730 has continuous traffic updates, including border crossing and ferry waits
- In rural areas, signs will give you a radio station to tune to for local road conditions, construction and so on
- Go to DriveBC.ca or call 1-800-550-4997.

Activity – Google maps or other map program

Have students plan their route. They should make note of the total mileage.

Activity - DriveBC

Have students use their phones or other device to visit drivebc.ca and check the road conditions for locations along their route.

Discuss what information is available on the site.

Students can also explore neighboring jurisdictions:

For Alberta, go to 511 Alberta: https://511.alberta.ca/#:Alerts

For Washington State, go to Washington State, Department of Transportation https://www.wsdot.com/traffic/trafficalerts/

Slide 13 - Weather information

Key points:

- Environment Canada provides weather information by phone and on online.
- Why is it important to check the weather before you travel?
- Has anyone been caught in bad weather because you didn't check?

Activity

Have students visit the *Government of Canada* website and check the weather conditions for their route. There is mobile weather app they can download, if they chose.

Weather info is found under Environment and natural resources / weather information.

https://weather.gc.ca/

Discuss other sources of weather information such as The Weather Network.

Slide 14 - Ferry schedules and travel information

Have student visit *BC Ferries* and explore what information is found there.

Ferry schedules and other travel information - BC Ferries:
https://www.bcferries.com/schedules/

Slide 15 - Locations of fuel stops and rest stops

Have students locate fuel and rest stops that they would use…

Estimating travel time

Time required: 20 minutes

Slide 16

Explain the formulas used to calculate the distance, average speed, and trip time:

- Distance = Speed multiplied by time: 80 km/hr x 9 hours = 720 km
- Average Speed = Distance divided by time: 720 km / 9 hours = 80 km/hr
- Trip Time = Distance divided by average speed: 720 km/ 80 km/hr = 9 hours.

One way to calculate total trip time is to allow 2.5 hours for every 150 kilometres you will travel; experience has shown this to be reasonable for calculating driving time, meals, fuel, and rest stops.

Example: Distance 810 kilometres/150 kilometres = 5.4 hours x 2.5 hours = 13.5 hours.

Ask: What other things do you need to consider when calculating travel time?

Answers may include:

Rest stops/meals, fuel stops

Ports of entry stops

Weigh scale stops and possible roadside safety inspections

Layovers

Compliance with hours of service regulations

Varying speed limits

Load weights

Route taken – i.e. mountains, city

Time of day

Volume of traffic

Weather

Ferry schedules

Personal endurance ability

Activity – Time calculations

Have students practice some travel time calculations. Create your scenarios below.

Activity - Estimating travel time

Have students work through their assigned scenario to determine travel time based on rest stops, HOS and any other needed time considerations.

Estimating fuel expenses

Time required: 10 minutes

Slides 17 - 18

Key points:

- In the unit on fuel efficient driving you learned how to calculate fuel usage. We are going to take this one step further and estimate fuel expenses
- Fuel consumption estimates are needed to plan fuel stops and to make sure you have enough cash or credit to cover the fuel.

Review

Fuel usage is based on a number of factors.

Ask: What factors can increase fuel consumption? They should remember this from the fuel efficiency lesson.

Answers should include:

- Driving too fast
- Prolonged idling
- Operating at too high rpm
- Stop and go driving
- Poor road conditions
- Mountainous terrain
- Head winds/tail winds
- Condition of the vehicle (i.e. low tire pressure, or defects in the engine or fuel line)

Activity – Estimating fuel expenses

Have the students use an online fuel calculator to estimate the fuel expenses for their trip.

Discuss converting metric and imperial quantities when crossing into the U.S.

Estimating personal expenses

Time required: 5 minutes

Slide 19

Briefly review trip expenses drivers need to consider.

Key points:

- Keep receipts or other documentation to prove expenses. Each carrier will have their own policies and procedures for reimbursement. Be sure to know who is responsible for what expenses
- There are fixed costs and variable costs. Fixed costs are things like permits and licences, tolls, ferry fees. Variable costs are expenses that vary depending on how much you are driving and what kind of work you're doing - things like fuel and food
- Small changes to spending habits can have a big impact on your personal finances.

Drivers should consider:

- Meals
- Layover/lodging
- Fuel
- En route repairs
- Towing
- Tolls
- Permits
- Special fees
- Fines
- Truck washes

Ask students: what else should be considered?

Activity – Estimating other expenses

Have students estimate food and other personal expenses based on their trip.

Sample route plan

Shipper address:

Consignee address:

List waypoints for stops:

Waypoints	Distance (km)	Travel time (average km per hr)	Fuel usage

Road and weather considerations:

Ferry time considerations (if applicable):

Location of fuel stops and rest stops you will use:

Estimated fuel cost:

Trip planning review quiz – answer key

Individually or in pairs, have students complete the review questions, then review answers with the whole class.

1. List all the things to consider when planning your route. **See 18 items listed in the student guide.**
2. List six trip planning steps
    - Ensure documentation is current and correct, plan the route, estimate travel time and plan for stops, estimate need for fuel and plan fuel stops, estimate travel expenses, confirm pick-up and delivery time.
3. Why it is good to have an alternate route when you plan a trip? In case of traffic congestion, crashes or incidents, or bad weather.
4. What risks could you encounter if you travel to an unfamiliar location without first confirming facilities and preferred routes?
    - Unable to get into the site due to vehicle size, construction, height or weight, or other impediments
    - Risk of personal danger in isolated or unsecure area.
5. List a source of reliable information about weather and road conditions in B.C. DriveBC.ca.

Trip planning homework activity

Instructions for this assignment are in the students' workbook.

As homework, ask students to individually plan a multi-day trip.

You could allow them to choose their own destinations or assign them.

Give them a few weeks to complete the assignment.

During a future class, have students share their plan and what they learned with the class. Save about 20 minutes for this.

Resources

Google maps: https://www.google.ca/maps/@54.1123525,-126.5556456,5z

Highway cameras – DriveBC: https://images.drivebc.ca/bchighwaycam/pub/html/www/index-Northern.html

Road conditions:

DriveBC: https://www.drivebc.ca/

511 Alberta: https://511.alberta.ca/#:Alerts

Washington State, Department of Transportation https://www.wsdot.com/traffic/trafficalerts/

Ferry schedules and other travel information - BC Ferries: https://www.bcferries.com/schedules/

The Weather Network: https://www.theweathernetwork.com/ca

Load restrictions for heavy vehicles and commercial transport trucks on B.C. Highways – B.C Government: https://www.th.gov.bc.ca/bchighways/loadrestrictions/loadrestrictions.htm

Distracted and impaired driving

Unit overview

This unit focuses on two of the most important safety issues in driving and trucking: distracted driving and impaired driving.

Total time: 60 minutes

Materials required

- A deck of playing cards
- Timer
- Audio/visual equipment
- Slide presentation

Learning outcomes from the MELT framework

3.1.1. Explains the importance of being fully alert when driving and the importance that judgement is not impaired in any way while driving.

4.1.25. Maintains attention and avoids sources of distraction while driving.

Introduction

Time required: 5 minutes

Slides 1 - 2

Provide an overview of the unit:

- Key topics and objectives for the lesson
- Estimated time
- How students will be assessed – a few test questions later

Fatal crash factors

Slide 2

In 2019 the combined percentage of speed, impaired and distraction was an astounding 79%. Three factors within the control of the driver.

Source: ICBC Quick Statistics - Contributing factors - Insurance Corporation of British Columbia | Tableau Public

Distracted driving

Time required: 30 minutes

Slides 3 - 7

Part of framework Module 4 – Professional driving

Driving distractions

Slide 3

Discuss distracted driving and what contributes to it.

- Many driver distractions are not technology-based but related to eating, adjusting controls, and distractions outside the vehicle.
- In the Humboldt bus crash that killed 16, the truck driver failed to heed a stop sign at an intersection due to being distracted by a loose tarp.

Ask: What other things can distract us when we are driving?

Use probing questions to briefly discuss answers: When might these occur and how can you reduce the risk?

Answers may include:

- GPS display
- reading printed materials
- distracting thoughts or emotions
- conversation with passengers
- music or talk radio
- beautiful scenery
- flying insects in the cab
- traffic or police incident
- writing or sketching
- personal grooming (brushing teeth, putting on makeup, shaving)
- using electronic devices such as laptop computers, cameras, video
- entertainment displays and programing portable audio players.

Fatal victims from distracted driving

Slide 4

Give students a minute to view the slide.

Note that in B.C., and average of 78 people die in crashes involving distracted driving every year.

Can you drive distracted?

Slide 5

Introduce and show the video.

Bison transport created this eye-opening video debunking the myth that you can drive while distracted and still drive safely. In the video you will see how distractions compromised the driver's focus on the road, and almost caused serious crashes.

After the video, ask students what key things stood out for them.

https://blog.bisontransport.com/so-you-think-you-can-drive-distracted (10:30).

Distracted driving penalties (as of July 2020)

Slide 6

- The fine for a single distracted driving violation ticket is $368, along with 4 penalty points that will be applied to a driver's record. On a first infraction, these points will also result in a driver paying a further $252 ICBC Driver Penalty Point premium, for a total of $620 for a first infraction.
- Drivers who get two or more distracted driving convictions in a three-year period are charged a Driver Risk Premium (DRP), which is billed annually and is separate from any insurance premiums. This amount will increase for each additional conviction.

- For example, drivers with two or more convictions for the use of electronics devices while driving over a three-year period could pay more than $2,500 in penalties in addition to their regular vehicle insurance premium.

Electronic device rules

Slide 7

Review electronic device rules for B.C.

British Columbia, like many jurisdictions, has strict rules about when and how you can use electronic devices while driving.

- A driver must not hold, operate, communicate or watch the screen of a hand-held electronic communication device.
- A driver must not send or receive text messages or email on any type of electronic device.
- A driver must not hold, operate, communicate or watch the screen of a hand-held electronic computing device, one of the purposes of which is to process or compute data.

Hands-free function ok – all must apply

Slide 8

A person may use an electronic device in a hands-free telephone function while driving if:

- The electronic device, as well as any part or extension of it, is not held or operated by hand
- It is voice-activated or requires only one touch in order to initiate, accept or end a call;
- If the device includes an earpiece, that earpiece can be worn in one ear only and must be placed in the ear prior to driving
- The electronic device is securely fixed to the vehicle or worn securely on the person's body, and is within easy reach of the driver's seat; and
- The device is installed in a manner that does not obstruct the driver's view of the front or sides of the motor vehicle or

interfere with the safety or operating equipment of the motor vehicle.

GPS

Slide 9

- GPS can be displayed but must be programmed before you begin driving or be voice activated.
- Commercial drivers are also permitted to have displays that provide information about the vehicle’s systems or location.

Activity – the effects of distraction

Slide 10

Drivers often think they can handle multiple tasks while driving – especially if they have been doing that without any consequences.

This activity demonstrates how the addition of multiple tasks can affect a driver's ability to maintain adequate attention to the primary task: driving and the need to place our primary focus on driving when we are behind the wheel.

Materials needed

- A deck of playing cards (or two)
- A timer
- A copy of the handout on the following page.

Instructions

- Select one student to perform the exercise, or have two groups participating at the same time, at different ends of the classroom.
- Ask one student to time how long it takes another to sort a well-shuffled deck of cards into four piles by suit (hearts, diamonds, clubs and spades).
- Share the elapsed time.
- Repeat the exercise, while having a third student quickly reading the questions in the handout aloud to the student. Ask the student to answer the questions as fast as possible.
- Share the elapsed time.
- After the activity, ask: Why the difference in the times? (The more tasks the brain is required to perform the longer it takes to perform any single one.)
- If there is time, allow others to try the activity.

Handout – effect of distraction

Questions to be read rapidly while the student is sorting cards

2 + 2

0 + 2 - 3

What color is an orange?

3 + 2

1 X 0

3 + 4

What month is it?

0 + 4

10 + 24

2 + 11

19 – 7

How do you spell "logistics"?

11 + 5

Name three vegetables

2 + 4

5 X 5

Name three types of transport trucks

4 - 4

Name three makes of vehicles

8 – 6

9 – 7

2 X 50

How many eggs in a dozen

20 – 11

82 – 57

Name five breeds of dogs

8 X 8

6 – 9

4 X 5

17 – 6

23 – 8

45 + 9

13 + 13

16 – 9

9 x 2

7 – 8

How many cards in a deck?

10 X 10

55 – 5

Good job!

Drugs and alcohol

Time required: 30 minutes

Part of framework Module 3 – Driving techniques

Slides 11 - 15

Ask students to brainstorm types of impairment. Answers may include:

- Alcohol, drugs, fatigue and emotions.
- If mentioned, explain that fatigue (if not already covered) will be discussed as part of the Hours of Service unit. This lesson focuses on drugs and alcohol.
- If mentioned, explain that emotions (if not already covered) will be discussed as part of the distracted driving lesson.

Fatal victims in crashes – alcohol, drugs, or medication

Slide 12

Review the statistics.

An average of 67 people die in impaired related crashes every year.

Penalties for impaired driving

Slide 13

B.C. has the toughest drinking and driving laws in Canada. If you're caught driving impaired, you could face these penalties:

- Driving suspension from 24 hours to 90 days. The driver must surrender their driver's licence and may not drive until the suspension period is over and they retrieve their licence from the police station.
- Vehicle impoundment
- Fines, from $600 and up to $4,060
- Jail time
- Mandatory rehabilitation
- Installation of ignition interlock in your vehicle.

- You may also have to pay a Driver Risk Premium, on top of your insurance.
- If you crash while driving impaired, you're likely in breach of your insurance policy. That means you could be personally responsible for 100 per cent of the costs if you damage someone else's property or injure them.

Ask: Other than driving, what other job related activities require sobriety?

Answers may include:

- Waiting at a terminal or facility
- Inspecting or servicing a commercial vehicle
- Loading or unloading a vehicle
- Repairing a disabled vehicle.

Discuss the drug testing required by many employers and for driving into the U.S.

Penalties and consequences

Slide 14

This slide shows more detail about penalties.

Ask students - Besides the penalties listed on the slide, what other costs or consequences could you suffer if you are caught driving while impaired? How could this change your life and the lives of your families?

Conduct a brief discussion.

Drugs and alcohol impair your

Slide 15

Briefly review the slide information. Ask for thoughts on this from the class.

Hours of service

Unit overview

MELT framework Module 8 - Hours of service compliance.

Reference – Student Guide, Chapter 15

This unit ensures that new truck drivers are fully aware of their obligations and responsibilities regarding hours of service regulations and how to maintain a daily log.

Drivers need personal fatigue awareness, a sense of responsibility for safety, and an understanding of the consequences for non-compliance in the form of fines, loss of employment, and even jail time resulting from fatigue-related crashes.

Pair this lesson with the lesson on fatigue. Either teach the fatigue lesson first or teach it as a follow up lesson.

Time required: 4.5 hours in the classroom

Lesson time overview. These times are only a guide.

		Minutes
Part 1	Introduction to logbooks	15
Part 2	Safety and compliance	45
	HOS time restrictions	60
	Logbooks & activities	90
	Other driving situations	30
	HOS review quiz	30

Materials required

- Hour log worksheets
- Audio/visual equipment
- Slide presentation – Hours of service
- Scenarios for logbook activity – to be created by the school

Videos

Slide 15 - A basic introduction to filling out log books (8:04)
https://www.youtube.com/watch?v=iHZKNIpF5G4

Instructors may show any appropriate videos or provide links for students to watch at home.

Learning outcomes from the MELT framework

8.1. Comply with the requirements of the federal hours of service regulations.

Learning indicators

8.1.1 Explains that the hours of service regulations apply to operating most commercial vehicles.

8.1.2 Explains that they are on-duty when driving, in care and control of a vehicle, and performing other types of work.

8.1.3 Explains that drivers must comply with hours of service regulations.

8.1.4 Explains that driving a commercial vehicle is prohibited:
- after being on-duty for 14 hours in a day and work shift
- after accumulating 13 hours of driving in a day and work shift
- when 16 hours have elapsed since their work shift began.

8.1.5 Identifies that a commercial vehicle may be operated for personal use, and for up to 75 km in a day when: the vehicle is empty and no trailer is being towed; no work of any sort is being done for a motor carrier; and the starting and ending odometer readings are recorded in the driver's daily log.

8.1.6 Explains that a work shift begins when they return to on-duty, after being off-duty for at least eight consecutive hours.

8.1.7 Identifies they are still considered to be on the previous work shift when returning to on-duty after less than eight hours off-duty, and they may be prohibited from driving if they exceed the 13, 14 and 16 hour rule.

8.1.8 Explains that a 7-day cycle allow a driver to be on-duty for 70 hours in a 7-day period

8.1.9 Explains that a 14-day cycle allows a driver to be on-duty for 120 hours in a 14-day period

8.1.10 Explains that a reset can only take place after the required minimum number of consecutive hours off- duty, and this period is called a "reset".

8.1.11 Explains that resetting a 7 day cycle requires at least 36 consecutive hours off duty.

8.1.12 Identifies that resetting a 14 day cycle requires at least 72 consecutive hours off duty.

8.1.13 Identifies that up to 2 hours of the required minimum daily off-duty time can be deferred from one day to the next as long as the deferred time is properly added to the correct portion of off-duty time in the following day.

8.1.14 Identifies that when encountering specifically defined adverse driving conditions, driving up to 2 hours beyond the daily limit is permitted, when remaining within the 16-hour work shift rule.

8.1.15 Identifies that, when adverse conditions cause a driver to be on-duty longer than is normally permitted, and this causes a driver to exceed the hours in their cycle, those cycle requirements must be met by the end of the following day.

8.1.16 Identifies that on-duty, driving and off-duty requirements do not apply when encountering an emergency, under certain circumstances.

8.1.17 Identifies that the "day" shown on a daily log is a 24-hour period which generally begins at midnight, but can start at any time set by an operator.

8.1.18 Explains that home terminal is the location at which the driver ordinarily reports for work and may include a temporary work site location designated by the motor carrier.

8.1.19 Identifies that a driver may be exempt from the requirements to complete and carry a daily log when: they drive within a radius of 160 km from the location at which the driver starts the day and returns to the same location

at the end of the day; and they work for an employer who maintains a record of their duty status.

8.1.20 Identifies that a record of each driver's duty status must track the driver's activities within each day, within the work shift, and within a duty cycle.

8.1.21 Identifies that a driver using a record of duty status instead of a daily log must still comply with all of the driving restrictions.

8.1.22 Identifies that proper use of the sleeper berth allows the off-duty period to be split.

8.1.23 Identifies that off-duty periods can be split into shorter periods in certain conditions.

8.1.24 Identifies that the Canadian federal hours of service requirements differ from those in the U.S.

8.1.25 Explains how to use an electronic log device.

Performance elements

8.1.26 Calculates when they can begin to drive, and how many hours are available for driving each day.

8.1.27 Stops driving when any one of the on-duty limits is reached.

8.1.28 Stops driving a commercial vehicle:

- after being on-duty for 14 hours in a day or work shift
- after accumulating 13 hours of driving in a day or work shift
- when 16 hours have elapsed since their work shift began.

8.1.29 Tracks their status within each day as defined on the daily log, and tracks the duty status within their work shift, which can start at any time of day.

8.1.30 Maintains a complete, legible, and accurate driver's daily log (in a written or electronic format) that fully complies with the federal and provincial regulations.

8.1.31 Carries daily logs that apply to the preceding 14 days, whenever operating a commercial vehicle requiring the driver to carry a log.

8.1.32 Retains daily logs as required by the regulations.

Part 1 – Introduction to logbooks

Time required: 15 minutes

Introduce logbooks at the beginning of the course and have the student keep a log for the entire period of their training. This will ensure they are able to complete a logbook correctly when they start work. Initially, practical instructors should help them fill it out at the end of each day.

After they have been using them for a couple of weeks, teach the detailed information.

Part 2 – Hours of service

Time required

Slides 1 - 6

Safety and compliance

Time required: 45 minutes

Slides 1 – 2 - Introduction

Key introductory points:

- Drivers are responsible for the safety of the largest and heaviest vehicles on the road
- Requires constant alertness and ability to respond quickly to whatever comes your way
- Hours of service (HOS) regulations limit when, and how long you are permitted to drive and work.

Slide 3 – Issues of compliance

Begin with the **crash scenario activity** and a discussion of the issue of doctoring logbooks and compliance.

After the activity review slides 4-6.

Slide 4 - Tampering

Slide 5 - Penalties

Slide 6 - Out of Service Violations

Activity – crash scenarios

Print or provide links to the following two news stories, or other appropriate news stories. In pairs or small groups, give students about 15 minutes to read and discuss the stories. After 10 minutes, have students share their thoughts with the whole class.

They should consider these questions:

- What were the key factors that caused the crash?
- What could the driver have done to prevent the incident?
- What were the personal consequences for the driver and their families?
- What were the consequences for others?

Scenario 1

Winnipeg truck driver found guilty of criminal negligence in deadly 2016 Highway 400 crash in Toronto. Global News. Updated April 30, 2021 4:21 pm.

https://globalnews.ca/news/7824038/highway-400-2016-fatal-crash-trial-verdict/

Scenario 2

"VERY TIRED": Truck driver sentenced to two years in prison for deadly crash near Merritt. Sourced from Infotel.ca. October 30, 2018.

https://infotel.ca/newsitem/very-tired-truck-driver-sentenced-to-two-years-in-prison-for-deadly-crash-near-merritt/it56934

HOS time restrictions

Time required: 60 minutes

Slides 7 - 16

Refer to the student guide and slides for information.

Logbooks

Time required: 90 minutes

Slide 17 – 19

Review the logbook information. Stress that it is a legal document subject to inspection when drivers are audited for compliance to HOS regulations.

Slide 19 - Video – SmartDrive Test: A basic introduction to filling out log books (8:04). https://www.youtube.com/watch?v=iHZKNIpF5G4

Logbook activity

- Create several scenarios for students to complete the log. These should include a variety of situations that a driver might encounter.
- Do one together as an example.
- Make copies of log sheets and give students about 10 minutes to fill them out based on the scenario.
- Have students use a pencil to permit in-class corrections. Note that an official paper logbook must be completed in ink. Remind them to complete the remarks section with locations and that 15-minute blocks for en route inspection should appear as annotations.
- When they are ready, review the correct completion with the whole class.
- A good way to challenge students' understanding is to provide some completed logbook graphs with mistakes on them and task students with finding the mistakes.
- Create and assign two or three additional scenarios as homework and review the correct completion in a future session.

Example of a logbook activity scenario:

- The driver was off duty until 6:00 am when he reported for work.
- He inspected his truck, coupled to and inspected the trailer and left the yard at 7:00 am.
- He drove until 9:15 am, stopped at a rest stop for 10 minutes to conduct a circle check, and continued driving.
- He drove for 2 hours and 40 minutes and stopped at a rest area for a meal.
- Leaving rest area at 12:35 pm, he arrived at the destination at 2:33 pm, dropped the trailer and connected to another one.
- He inspected the trailer and left the yard at 3:15 pm, drove until 4:55 and took a 10 minute break in a rest area and then continued on his way.
- He returned to his home terminal at 6:35, completed a post trip inspection and returned home in his personal vehicle at 7:05 pm.

Electronic logging devices (ELDs)

Slide 20

Introduce electronic logbooks. See CVSE website for current information.

Other driving situations

Time required: 30 minutes

Refer to the student guide and slides for information.

Slide 21 - Drivers operating within 160 km of home terminal

Slide 22 - Ferries

Slide 23 - Driving north of the 60th parallel

Slide 24 - Driving into the U.S.

Slide 25 - Emergencies and Adverse Conditions

Slide 26 - Internal monitoring

HOS review quiz

Time required: 30 minutes

Slide 27

Either in-class or as homework, have students complete the HOS review quiz.

Review the answers at an appropriate time during the course.

HOS review quiz - answer key

1. What are the four categories that are recorded on a logbook? (on duty, off duty, sleeper berth, on duty not driving)
2. What are the cycles and how many hours are in each? (Cycle 1: 70 hours of on-duty in 7 days, Cycle 2: 120 hours on-duty in 14 days)
3. When can a driver defer hours of the off duty time to the following day? (If they are not splitting time off duty or inclement weather)
4. What is the maximum hours that can be deferred? (2 hours)
5. Why are hours of service regulations in place? (To reduce the risk of fatigue related crashes and to provide drivers opportunity to rest).
6. Are you permitted to record pulling off the road and taking a nap in a reclining seat of a commercial vehicle as sleeper berth time? (No)
7. What's the maximum amount of driving hours permitted in a day in Canada? (13 hours)
8. How many consecutive hours of off-duty time must be taken every day? (A minimum of 8 – and 10 in a 24 hour period)
9. What's the maximum amount of on-duty time in Cycle 1? (70 hours in 7 days)
10. What's the maximum amount of on-duty time in Cycle 2? (120 hours in 14 days)
11. When you're operating in Cycle 2, when must you take 24 consecutive hours of off-duty time? (Prior to accumulating 70 hours)

12. How many consecutive hours of off-duty time must be taken to reset the cycle in Cycle 1? (36)

13. How many consecutive hours of off-duty time must be taken to reset the cycle in Cycle 2? (72)

14. How often does a driver have to take 24 consecutive hours of off-duty time, regardless of cycle? (Once every 14 days)

15. When must you submit your logbooks to the carrier? (Within 20 days)

16. What are the consequences if you exceed your maximum on-duty hours and an enforcement officer stops you? (A fine, may be prohibited from driving)

17. When may a driver be exempt from filling out daily logs? (If they operate a commercial vehicle within a radius of 160 km of the home terminal.)

18. What's the maximum amount of driving hours permitted in a day in the United States? (11 hours)

19. True or false – You are required to record your total mileage on your log. (True)

20. How many kilometres per day can a driver use a commercial vehicle as a personal use exemption? (75 km)

Practical training connection

Have student practice tracking and logging their activity during the course – even if staying within 160 km. Practical instructors should check and discuss the log with the students.

Resources

National Safety Code, Standard 9 – Hours of Service

https://ccmta.ca/images/publications/pdf/NSC_2018/Standard_9_Hours_of_Service_August_2010.pdf

Winnipeg truck driver found guilty of criminal negligence in deadly 2016 Highway 400 crash in Toronto. Global News. Updated April 30, 2021 4:21 pm.

https://globalnews.ca/news/7824038/highway-400-2016-fatal-crash-trial-verdict/

"VERY TIRED": Truck driver sentenced to two years in prison for deadly crash near Merritt. Sourced from Infotel.ca. October 30, 2018.

https://infotel.ca/newsitem/very-tired-truck-driver-sentenced-to-two-years-in-prison-for-deadly-crash-near-merritt/it56934

Fatigue

Unit overview

This unit is related to the hours of service lesson. You could either do the activity in this unit as a way to introduce HOS or do it after students have learned about HOS as a follow up.

In this unit you will do a very brief introduction and assign the activity as homework. Then later discuss the questions in class.

Total time: 30 minutes

Materials required

- Student workbook

Reference: Health and Safety, Fatigue – Student Guide

Learning outcomes from the MELT framework

1.3.3. Describe occupational factors which can contribute to health-related challenges such as obstructive sleep apnea.

3.1.1. Explains the importance of being fully alert when driving and the importance that judgment is not impaired in any way while driving.

3.3.3. Uses effective observation skills including maintaining a high level of alertness.

4.1.2. Describes common collision scenarios and contributing factors, and explains ways to avoid.

4.1.10. Explains how personal factors such as driving motives, driving experience, health, impatience/aggression, and overconfidence affect risk perception and driving choices

What's your risk?

Explain that as car drivers, students will be used to pacing themselves based on their level of fatigue. Now, they must become used to driving based on their fatigue level and legal requirements.

Pre-requisite homework assignment

Assign the quiz – ***Are you at risk of falling asleep behind the wheel?*** As a homework activity. Student should come to class prepared to discuss.

Explain that this is for their personal information and they do not need to share their answers.

Explain that there are many myths about fatigue—we have an activity to discuss these.

In class, review the answers and discuss.

Debrief the lesson:

- Has your perception of fatigued driving changed now that you are aware of the myths and consequences? How?
- Where and when have you experienced fatigue while driving and how did it affected you?
- Review the legal consequences of driving without due care and attention. Ask student if they know.See link to ICBC below.
- https://www.icbc.com/driver-licensing/tickets/Pages/fines-points-offences.aspx
- Stress how it is better to prevent fatigue rather than deal with it.
- Wrap up lesson by linking to fatigue being the reason for HOS rules.

Are you at risk for falling asleep behind the wheel? – Answer key

1. FALSE.

    - Studies have found a direct correlation between the numbers of hours a person works and their risk of being in a drowsy driving crash.
    - People who work more than one job where their primary job involves an atypical schedule are twice as likely to be involved in a sleep-related crash when compared to people in non-sleep related crashes.

21. FALSE.

    - According to a study by the AAA Foundation for Traffic Safety, working the night shift increases a person's risk of being involved in drowsy driving crash by nearly six times.

22. FALSE.

    - Sleep-related crashes are most common in young people, who tend to stay up late, sleep too little, and drive at night.
    - One study found that in 55 percent of sleep-related crashes, drivers were age 25 years or younger and were predominantly men. Another study found almost one-third of commercial drivers have some degree of sleep apnea.

23. TRUE.

    - Research has provided a good picture of the common characteristics of drowsy-driving crashes, which tend to occur at night or in mid-afternoon, involve a single vehicle running off the roadway, lack any evidence of braking, and involve a young male driving alone.

24. FALSE.

    - Sleep apnea is a condition in which a person's airway collapses many times to halt breathing until the person briefly

awakens. The most common signs of sleep apnea are loud, irregular snoring, and excessive daytime sleepiness.

- Studies indicate that persons with untreated sleep apnea have two to seven times more crashes than people without the disorder. Studies also show that once treated, most patients can be safe drivers once again.

25. FALSE.

- Things such as heavy meals, warm rooms, and long drives only unmask the presence of sleep deprivation or sleep debt; they do not cause sleepiness.

26. FALSE.

- Sleep is not voluntary. If you're tired, you can fall asleep and never know it.
- When you're driving at 60 miles per hour and fall asleep for a few seconds (a microsleep), you can travel up to the length of a football field without any control of your vehicle.

27. TRUE.

- According to studies, drivers in fatigue-related crashes were more likely to report problems sleeping prior to a crash than drivers in other non-sleep crashes.

28. FALSE.

- An open window or music has no lasting effect on a person's ability to stay awake. In fact, they may mask the person's lack of alertness further.

29. TRUE.

- If you are driving and your thoughts begin to wander, it is time to pull over and take a short nap, consume some caffeine, or stop driving for the day.

30. FALSE.

- Sleep is not money. You can't store up sleep to borrow it later on. But, just as with money, you can go into debt.

31. FALSE.

- The only safe driver is an alert driver. Even the safest drivers become confused and use poor judgment when they are sleepy.
- In addition, alcohol makes fatigue much worse. One drink has the same effect on a tired driver as four or five drinks for a well-rested person.

32. FALSE.

- Drinks containing caffeine, such as coffee and energy drinks and sodas can help you feel more alert, but the effects only last a short time.

33. TRUE.

- The average person needs 7 or 8 hours of sleep a night.

34. FALSE.

- Sleep debt is the cumulative effect of not getting enough sleep. A large sleep debt may lead to mental and physical fatigue that negatively affects mood and cognitive performance.
- Once sleep is missed, it is gone for good. Make an effort to get adequate sleep each night.

Cargo securement and security

Unit overview

While being a professional driver involves several tasks to operate the vehicle safely, maintaining secure cargo is a key part of a driver's job.

This unit is not intended to teach students to be experts at securing all types of cargo – they will receive training from their employer for those details. This lesson should leave students with a clear understanding of the basic cargo securement requirements and cargo loss prevention procedures as listed in the learning outcomes.

Time required:

- 3.5 hours in the classroom
- 2 hours in the yard

Materials required

- audio/visual equipment
- a whiteboard or flipchart and pens
- Slide presentation: Cargo securement
- Pictures or samples of safety devices to examine
- Student workbook

Audio/video list

CBC Podcast: Merchandise on wheels: why thieves are stealing cargo trucks (7:16)

https://www.cbc.ca/news/canada/hamilton/cargo-truck-thefts-1.5278924

Learning outcomes from the MELT framework

9.1. Comply with basic cargo securement requirements

Learning indicators

9.1.1. Explains that every commercial vehicle transporting cargo must have the cargo secured according to the regulations (National Safety Code Standard 10).

9.1.2. Explains that the requirement to secure cargo includes any material, equipment or other loose article carried on the vehicle, including dunnage, blocking, tarps, tools, equipment, spare materials, etc.

9.1.3. Explains that all cargo must be secured so that it cannot move, including:

- to ensure that it cannot fall off the vehicle, or in any way be lost
- to prevent forward, rearward and sideways movement, and in some cases must also be secured to prevent upward movement.
- so that it cannot shift in a way that can affect a vehicle's stability or manoeuverability in a negative way.

9.1.4. Explains that cargo must be loaded in such a way that it does not interfere with the driver's ability to drive the vehicle safely, and does not block vehicle entry or exit.

9.1.5. Explains that articles of cargo are generally secured against the vehicle's structure and by using devices such as tie-downs, blocking and bracing.

9.1.6. Explain that devices used to secure cargo are generally rated for their strength and that most cargo requires a minimum number of tie-downs with particular working load limit ratings.

9.1.7. Explain that cargo tie-downs are specifically designed and rated for such use, must have a means to be tightened, and must be used according to the manufacturer instructions.

9.1.8. Explain that tie-down ratings are determined by manufacturers, are expressed as a "working load limit" (WLL), and marked on the tie-downs.

9.1.9. Explain that the combined strength of individual tie-downs used together to restrain cargo is called the "aggregate working load limit".

9.1.10. Explain that friction between cargo and vehicle surfaces, and friction between different articles of cargo that are in contact, helps to keep some types of cargo secure.

9.1.11. Describe how size, shape and weight of cargo generally dictates the required number, strength and placement of tie-downs.

9.1.12. Explain how cargo fully enclosed within a vehicle structure will not generally require tie-downs, but may require blocking, bracing or devices to increase friction between the vehicle and cargo.

9.1.13. Explain that the aggregate working load limit of tie-downs used to secure cargo must equal at least 50% of the cargo weight.

9.1.14. Explain that the individual pieces of cargo will, in some cases, need to be unitized into larger units of cargo.

9.1.15. Explains that they are not required to inspect cargo if a vehicle has been sealed to prevent access and they have been instructed by their employer not to remove the seal.

9.1.16. Explains that some cargo can be secured according to general regulatory requirements.

9.1.17. Explains how certain commodities require specific securing methods, devices and equipment to comply with specific regulatory requirements.

9.1.18. Identifies that specific securement methods are required for: logs, dressed lumber and similar building materials, metal coils, paper rolls, concrete pipe, inter-modal containers, automobiles, light trucks and vans, heavy vehicles equipment and machinery, flattened or crushed cars, roll-on/roll-off and hook-lift containers, boulders, etc.

9.1.19. Describes the basic operation of portable or on-board cargo heating equipment.

9.1.20. Explains how to arrange cargo to improve both aerodynamics and fuel efficiency.

Performance Elements

Generally, learning the hands-on portion of cargo inspection and securement will be handled by the employer. Depending upon the trailer used for training, instructors must provide some basic hands-on instruction on cargo securement devices during the course.

9.1.21. Confirms that cargo securing methods or devices are the proper type, and are properly used, strong enough, and in good condition.

9.1.22. Inspects cargo, related articles and methods used to secure the cargo before driving, and at specific intervals during the trip to confirm everything is properly secured to comply with regulations.

9.1.23. Inspects cargo and related articles at specific intervals during the trip to ensure everything remains properly secure to comply with regulations, and according to workplace practices, procedures and policies.

9.1.24. Inspects the condition and integrity of the tie-down devices, and adjust tie-downs as necessary to keep cargo secure during transport.

9.2. Prevent cargo loss claims and follow required procedures to maintain secure facilities, prevent cargo loss and avoid damage.

Learning indicators

9.2.1. Identifies that operation of cargo handling equipment must be performed in the proper manner, and only when a person is fully trained and authorized.

9.2.2. Explains use of cargo seals, pin locks and similar vehicle security devices.

9.2.3. Describes how to use cargo access doors in a safe manner, and protect against potential falling cargo when opening doors.

Performance elements

9.2.4. Handles and loads cargo carefully, and describe basic ways to confirm that all cargo is properly packaged, unitized, arranged and secured inside facilities and vehicles.

9.2.5. Uses appropriate Personal Protective Equipment properly and as required and recognize that such use may be required, inside or outside of every workplace, shipper facility and customer facility.

Introduction

Note: all times listed in the lesson are approximate and instructors will need to know and refer to information in the student guide and resource information provided.

Time required: 5 minutes

Slide 2 – Lesson introduction and overview

Introduce the topic, stressing the importance of cargo securement.

Cargo securement standards

Slides 3 to 4

Time required: 20 minutes

Review and discuss the eight points listed under cargo securement standards in the student guide.

Summarized inspection points using the chart (see slide).

Key points:

- The cargo securement regulations use terms such as “immobilize”, “contain” and “restrain” to define how cargo might be secured on or within a vehicle. These terms really describe different ways of making cargo secure.
- Immobilize means “not moving” or “incapable of being moved”.

Discuss the importance of cargo documentation and why it must be left in an obvious place in the cab.

Discuss why it is important to verify that the cargo they’ll be transporting matches the paperwork and is properly secured.

Securement systems and devices

Time required: 40 minutes

Slide 5 - Securement systems

Key points:

- You must be able to make any kind of maneuver with your vehicle, including a swerve, a sudden lane change or a panic stop, without worrying about the security of your load
- If you are not certain your load will be secure during such an event, or if you are afraid of what would happen to your load if you had to make an emergency stop, you better take a good look at the way the load is secured.

Slides 6 - 8 - Securement devices – tiedowns

Key points:

Cargo tiedowns may be any of the following, or they may be assemblies that include more than one of these elements:

- Chain
- Web straps or synthetic webbing
- Rope, natural or synthetic
- Wire rope or cable
- Steel strapping

A tiedown must be designed, constructed and maintained in a way that the driver can tighten it. To function properly, tiedowns must not:

- Have knots or obvious damage
- Be in distress
- Have any weakened part or weakened section

Slide 9 – Securing freight in vans

Discuss the information from student guide.

Slide 10 - Securement devices – tiedowns

Key points:

No unmarked tie downs allowed - must be marked by the manufacturer with the Working Load Limit (WLL).

- Securement devices must be strong enough to properly secure a load.
- Manufacturers test these devices to determine how much force can be applied to them before they will break.
- The WLL of a securement device refers to the maximum load that may be applied to that device during normal service.

Tie downs must not come loose, unfastened, opened or released while the vehicle is moving.

- All tie downs/securement systems must be located inside any rub rails whenever practical.
- Use edge protection where a tie down is subject to wear or cutting at the point where it touches an article of cargo. Edge protection must resist wear, cutting and crushing.
- Some tiedowns are passed over or through the cargo. When they are properly used, a downward force is created to increase the friction between the cargo and the vehicle's deck.
- The friction created restrains the cargo.

You may need a certain number of tie downs to keep your cargo secure.

When a piece of cargo is not blocked or positioned to prevent movement in the forward direction, the number of tie downs needed depends on its length and weight.

If the item is longer than 3.04 metres (10 feet) in length, it must be secured by:

- Two tiedowns for the first 3.04 metres of length; plus
- One extra tiedown for every 3.04 metres of length, or fraction of, beyond the first 3.04 metres.

If cargo is blocked or braced to prevent forward movement by a header-board, bulkhead, or by other means, then it must be secured by at least:

- One tiedown for the first 3.04 metres of length; plus
- One extra tiedown for every 3.04 metres of length, or fraction of, beyond the first 3.04 metres (if cargo is longer than 3.04m).

NOTE: Before a securement system is selected, the driver must ensure that it is appropriate for the cargo size, shape, strength, and characteristics.

Slide 11 – Working load limit

Discuss information in student guide.

Slide 12 - Three ways to transport cargo

Explain the three ways to transport cargo.

- Fully contained
- Immobilized
- General securement

Explain:

- Articles of cargo that are likely to shift, tip or roll must be restrained by chocks, wedges, or a cradle to prevent movement. These restraints must stay fastened or secured while the vehicle is moving.
- The proper securement of cargo is important not only for the protection of the cargo itself, but also for ensuring the safety

of a driver and the motoring public. Cargo that shifts or tips may cause a vehicle to tip or operate in an unsafe manner.

Slide 13 - Weight distribution

Key points:

- For easy handling of the truck, it is important that the cargo weight is properly distributed
- Fines imposed on drivers hauling loads that exceed weight limits can be very costly—to both carriers and drivers
- Weight limits and size limits. How weights are checked
- The importance of drivers being familiar with size and weight limits as they drive across the country
- How distributing weight correctly can prevent a truck from being classed as overweight
- Hazards of loads being hauled with weight improperly distributed.

Specific commodities securement

Time required: 30 minutes

Slides 14 - 24

Photos on the slides are also in the student guide.

Give a brief overview of methods of loading and securing different types of cargo. Drivers should receive training at the company for any specific cargo they will be carrying.

For information see the student guide and CCMTA resources at the end of this unit.

Cargo securement incident scenarios

Time required: 30 minutes

Break the class into three groups. Assign a different ***cargo incident scenario*** from the student workbook to each group.

Give the groups 10 minutes to read the scenario together and discuss the questions.

After 10 minutes bring the groups together and have each group briefly report on the scenario and their answers. Discuss further as needed.

Scenario 1 – Environmental protection act violation

- What was the offence that led to the fine? - The discharge of a contaminant into the natural environment that was likely to cause an adverse effect.
- What mistake did the driver make? - Not checking to ensure the load was secured before closing the trailer doors.

Scenario 2 – Humbolt crash – owner and driver charged

- What was the offence that led to the fine? - Not stopping at a stop sign.
- What mistakes did the driver make? - Failing to keep a daily drivers log, neglecting to comply with safety regulations, and having more than one daily logbook, and not having or following a written safety program.
- The driver should have:
  - had a daily log current to the last change in duty status
  - copies of the driver's daily log for the previous 7, 8 or 14 day period, to go with the driving cycle being used had all supporting document issued en-route, such as bills of lading, shipping documents, fuel receipts and accommodation receipts for expenses.
  - secured the load to prevent distractions.

Scenario 3 - Trailer loads can shift, resulting in fatalities

- How was the driver killed? What could have prevented the accident?

Review the load securement tips for truck drivers from WorkSafeBC brochure.

- Choose as level a surface as possible when loading, unloading, or adjusting loads. Very little slope is needed for a load to slide off.
- Deflate the trailer's air bags before loading or unloading.
- Always follow the manufacturer's instructions for truck and trailer operation.
- Ensure that the load-securing straps are only loosened enough to allow loads to be adjusted.
- Make sure your dunnage is dry, clean, and free from materials (such as snow and ice)
- Discuss safe work procedures for loading operations with the forklift operator before the work begins.
- Maintain eye contact with the forklift operator.
- Stay out of the load's fall zone until loading and unloading are finished and the person in charge of the loading operations (for example, the forklift operator) has given the all-clear.
- Wear personal protective equipment (for example, safety headgear and high-visibility apparel) when loading and unloading trucks.

Cargo theft and security

Time required: 20 minutes

Slides 27 - 30

Slide 27 - Cargo security

Discuss cargo security and how to be mindful of security for yourself, your rig and your cargo when on the road.

Discuss the prevalence of cargo theft.

The map on the slide shows the distribution of reported cargo theft in Canada. So, while cargo is stolen across the nation, the highest concentration of reported cargo theft is in Ontario – with 54% of reported thefts.

According to the Insurance Bureau of Canada (IBC), there's estimated to be approximately $5 billion worth of cargo theft in Canada every year. Only a fraction of the stolen goods, which range from lobsters, to steaks, to shoes, are ever recovered.

Slide 28 - CBC News - Radio: Merchandise on wheels

Listen to this CBC Radio podcast. $471,000 worth of Blundstone footwear were stolen in Woodstock, Ontario.

CBC Radio Podcast: Merchandise on wheels: why thieves are stealing cargo trucks (7:16).

According to the Insurance Bureau of Canada, there’s an estimated $5 billion worth of cargo theft in Canada every year. Angelique Magi, of the Guarantee Company of North America explains why customers should care.

https://www.cbc.ca/news/canada/hamilton/cargo-truck-thefts-1.5278924

Slide 29 - Tips to prevent theft

Key points:

- Explain that cargo thieves are opportunists and sometimes organized crime. Locations for theft include
- Truck stops and highway rest areas are the most targeted locations at more than one-third (39%) of all incidents
- Modal yards (managed by trucking companies, railroads or ocean carriers) at 27%
- Unsecured locations (drop lots, motel, restaurant and mall parking lots) at 25%
- Other cargo thefts and disappearances include warehouse burglaries (6%) and hijackings (3%).

Tips for preventing cargo theft:

- Make use of technology – immobilizing devices
- Ask for cargo theft training from your company
- Back up to a wall or if travelling in a convoy, park trucks tail to tail – to prevent doors from being opened
- Use low-tech security too – plenty of locks
- Research cargo theft hot spots along your route and avoid those if possible.

Slide 30 - Recognize it and report it

Explain that if cargo theft goes unreported, property recovery and prosecution becomes a challenge. Cargo theft cheats consumers, retailers, insurers and the trucking community, and wastes law enforcement resources.

Cargo securement assessment activities

Time required: 30 minutes

- Matching activity – 10 minutes
- Review questions – 20 minutes

Matching cargo definitions – answer key

_1_ Anchor point _9_ Binder _2_ Bulkhead _3_ Chock _8_ Friction mat _4_ Load capacity _11_ Pallet _5_ Strapping _7_ Tarp _12_ Dunnage _10_ Winch _6_ Working load limit	1. The part of the structure, fitting or attachment on a vehicle or cargo to which a tiedown is attached. 2. A vertical barrier across a vehicle to prevent forward movement of cargo. 3. A device or structure that holds a circular article to prevent it from rolling. 4. The weight of cargo that a vehicle can carry when loaded to its allowable GVW. 5. A strip of material that may be used to unitize articles and is tensioned and clamped or crimped back upon itself. 6. The maximum load that may be applied to a component of a cargo securement system during normal service, usually assigned by the manufacturer of the component. 7. A waterproof sheet used to cover and protect cargo. 8. A device placed between the deck of a vehicle and cargo or between articles of cargo to help prevent slippage. 9. A device used to tension a tiedown or combination of tiedowns. 10. A device for tensioning a webbing or wire rope tiedown that's fitted with means to lock the initial tension. 11. A platform or tray on which cargo is placed so that it can be handled as an article. 12. Material used to fill a void between articles of cargo and the structure of the vehicle to prevent movement of the articles of cargo.

Cargo securement review quiz

1. Who is responsible for an overloaded vehicle? (The driver).
2. When must the cargo be re-inspected? (Change of duty, after driving 3 hours, after driving 240 km). (3 marks)
3. What must be marked on the tiedown? (Working load limit (WLL).
4. List two way to secure tarps? (Rope, webbing, elastic hooks). (2 marks)
5. What happens when the front axles are underweight? (This will affect the safe steering of the truck).
6. Where can you find specific cargo securement regulations? (NSC Standard 10).
7. What are the two main reasons for covering cargo? (Spill protection and cargo protection). (2 marks)

Practical training connection

In the yard

Hands-on session - teach trainees how to throw tie down straps over a trailer or flat deck load and secure them with a cinch.

Inspect and discuss any cargo on trailers in the yard.

On the road

At appropriate times on the road, discuss various loads seen on other trucks such as:

- Wide load
- Over height load
- Logging truck
- Various cargo on flatdecks
- Car carrier
- Livestock trailer
- Gravel trucks with pup
- Unsecure loads.

Resources

Driver's Handbook on Cargo Securement – A guide to the North American securement standard (2005)
http://ccmta.ca/images/publications/pdf/cargo_driver_handbook.pdf

National Safety Code Standard 10, Cargo Securement, guidance and interpretations (updated May 2016): http://ccmta.ca/images/pdf-documents-english/cargo_securement/Interpretations_and_Guidance_2016.pdf

National Safety Code, Standard 10 – Cargo Securement – Dressed Lumber and Similar Building Materials on Flatbed Trucks and Trailers (February 2011)

http://ccmta.ca/images/pdf-documents-english/cargo_securement/Dressed_Lumber_Guidance_2011.pdf

National Safety Code for Motor Carriers, Standard 10 – Cargo Securement (June 2013): https://ccmta.ca/images/pdf-documents-english/cargo_securement/NSC_Standard_10-_June_2013.pdf

Motor Vehicle Act Regulations: Division 35 — Cargo Securement

Insurance Bureau of Canada (IBC) website:
http://www.ibc.ca/nb/business/business-crime/cargo-theft

- Cargo Theft Prevention – Peel Regional Police Brochure
  - English / Punjabi / Hindi / Urdu
- Cargo Theft Assessment – Truck yard security assessment – Peel Regional Police
  - English / Punjabi / Hindi / Urdu

National Safety Code Program:
http://www.th.gov.bc.ca/cvse/national_safety_code.htm

Carrier Safety Guide (PDF):
file:///C:/Users/kq3r/Downloads/Carrier%20Safety%20Guide%20CVSE2000%20(082017).pdf

Health and safety

Unit overview

This unit is designed to provide the student with some insights into the mental and physical demands of the job as a professional driver. A big part of truck driver safety has less to do with the vehicle, and more to do with the driver.

This unit stresses the need for drivers to adopt a healthy lifestyle and the importance of using measures to protect themselves, maintain good health and ensure safety so they can be rested, alert and focused behind the wheel. Prevention is the key.

Total time: 90 minutes (1.5 hours)

Materials required

- Quiz: Are you at risk for falling asleep behind the wheel?
- Blog post: End Workplace Violence
- Audio/visual equipment
- A whiteboard or flipchart and markers
- Slide presentation: MELT - Health and Safety.

Video list

The Healthy Trucker workout – 17 ways to exercise with the truck (4:21)

https://youtu.be/mKMC63ysO9w

WorkSafeBC – Arvind's story (3:24)

https://www.youtube.com/watch?v=1zP1qi8-N_o

Three points of contact: Be safe (1:26)

https://www.youtube.com/watch?v=bp9TAZhU0FY

WorkSafeBC: Ergonomics for Truckers (2:43)

https://www.youtube.com/watch?v=ZHO_EThsKps&feature=youtu.be

WorkSafeBC - Donna's Story: Delivery Truck Driver Safety (3:22)

https://www.youtube.com/watch?v=WTGsueqPP3s

Learning outcomes from the MELT framework

1.1.2. Identify that standards may apply to worker obligations, rights and responsibilities; employment health and safety; labour agreements; etc.

1.1.3. Explain the need to identify workplace hazards according to workplace practice, procedures and policies, and how hazards information is communicated.

1.1.4. Describe common workplace hazards and risks and how such hazards and risks can change.

1.2.3. Adhere to regulations that require employers and workers to provide a workplace in which everyone feels secure and free of unnecessary conflict.

1.3. Explain the importance of being "fit for work", maintaining a healthy lifestyle, and balancing personal and work life.

1.3.1. Explain that some types of driving require significant amounts of time away from home. This schedule can cause work-related and personal stress and can affect family relationships.

1.3.2. Explain that lifestyle and dietary factors can influence fatigue, performance, physical fitness and agility.

1.3.3. Describe occupational factors which can contribute to health-related challenges such as back strain, injuries caused by slips and falls, etc.

Introduction

Slide 1 - 2 – Lesson overview

Provide an overview of the unit

Health and wellness challenges

Time required: 10 minutes

Slide 3

Brainstorm - Why do you think life on the road can make it difficult to stay healthy?

Answers might include:

- irregular schedules
- long hours
- finding time to exercise
- limited access to healthy food
- drugs, alcohol or tobacco use
- fatigue
- stress
- exposure to chemical hazards
- physical demands of the job
- injuries
- workplace violence
- sleep challenges.

Slide 4 – Causes of workers' compensation claims

Review and discuss the top 10 workers' compensation incident causes for drivers employed in general trucking.

Chart also found in the student guide, health and safety chapter.

Slide 5 - Physical aspects of the job

Explain that the most common actions requiring physical strength include:

- Pushing and Pulling – up/down and two handed
- Lifting and Lowering - up to 24 kg (53 lb.)
- Carrying - weight up to 24 kg (53 lb.) between 1.5 – 6 metres (5 - 20 ft.)
- Walking, climbing, crouching, neck movements, reaching, elbow and wrist movements.

Stress

Time required: 10 minutes

Slides 6

Key points:

- Professional drivers are constantly fighting bad weather, distracted drivers, dealing with difficult shipping and receiving personnel as well as tight deadlines, all of which cause some truck drivers a lot of stress.
- Being away from home for long periods or on a regular basis can put a strain on family relationships.
- Stress can have a tremendous effect on your body and you might not even realize it.

Brainstorm - What are some of the signs of stress?

- Have groups briefly discuss times when they or someone they know have exhibited signs of stress. How did that affect their life?
- Explain – It's important to reduce, or manage, the amount of stress in your life and to prevent some of the symptoms we discussed.

Brainstorm – What are some ways you can reduce stress?

Briefly discuss ideas, ensuring the following have been covered:

- Try to get at least 30 minutes of physical activity at least three times a week. Exercise is proven to reduce stress and help you to sleep better
- Focus on positives. Spending your leisure time on hobbies and other activities will help distract you from worries
- Focus on the present rather than worrying about issues or mistakes in the past
- Use relaxation techniques, breathing exercises, or meditation when you feel tense
- Focus on family when you're home. Have a support system
- Plan your route to reduce time pressures
- Listen to music or audio books
- Eat a healthy diet and try to sleep regularly.

Option: display and review the information at Highway Transport website: https://drive4highway.com/8-ways-for-truck-drivers-to-reduce-stress/

Homework activity: time management

Key points:

- One of the most significant causes of stress is the pressure you feel when you can't meet deadlines or when you can't accomplish everything you need to get done in a specific timeframe either at work or at home.
- There are some well-established time management techniques that can enhance your life and help manage stress.

Homework activity – time management practice – follow these steps during the course to practice managing your time as a way to reduce stress.

- List all your "to do's" for the month
- Establish priorities
- Break tasks into small steps
- Eliminate clutter

- Fill waiting times with productivity
- Observe your behaviour.

Staying healthy

Time required: 20 minutes

Healthy eating

Slides 8 - 10

Slide 7 – Healthy eating, healthy living

Introduce the topic of eating well.

Did you know that 86% of Canadian truck drivers are overweight or obese? Being overweight and obese is linked to more than 60 medical disorders.

https://www.truckinginfo.com/157505/how-truck-drivers-can-eat-healthy-on-the-road

Slide 8 - Tips for healthier eating

- Eating every three hours helps to maintain stable blood sugar levels.
- Keep a water bottle in the cab, and stock Perrier or soda water for something bubbly.
- Cover half your plate with vegetables if you stop at a truck stop food bar.
- Eat breakfast every day.
- Snack on healthy foods.
- Eat more salad and leafy greens.
- Drink a lot of water and avoid pop and energy drinks.
- Don’t drink more than two cups of coffee each day.

Keeping fit

Slides 9 – 10

Many drivers say they are too busy to exercise. However, it is important to exercise at least 20-30 minutes every day. The benefits of regular exercise are nearly endless. Getting exercise and getting or staying fit helps both your mind and body. Regular exercise helps combat weight gain and conditions like heart disease and high blood pressure.

Slide 9 – Keeping fit

Ask students how they plan to stay in shape or increase the strength necessary for doing the job. As a general goal, they should aim for at least 20-30 minutes of moderate physical activity every day.

Brainstorm - What exercises could you do around a truck and while driving?

- It is roughly 50 metres around an 18-wheeler. Walking around it 20 times equals one kilometer.
- Park farther away from the truck stop when stopping to eat or refuel.
- For those interested in more of a strength-training approach to fitness, push-ups, pull-ups, squats, and lunges can be performed beside your truck and surrounding area.
- There are many different programs and apps available for bodyweight training. Most exercises involve some form of pushing, pulling, or squatting, most of which can be adapted to your truck and surrounding area.

Exercises you can do while driving:

- Try an abdominal crunch. Squeeze your abs and hold for the length of a song—or at least two minutes. Repeat this move at every red light.
- Do shoulder shrugs. This is a great relief of tension that can build up around your neck. Lift your shoulders up to your ears (like you’re shrugging), and hold them there for a few seconds, then slowly release. Do this 15 times in a row whenever you feel tension building in that area of your body.

Exercises you can do in the cab

- Pushups – Pushups only require body weight and minimal space which makes them the perfect exercise for truckers. ...
- Planks – Similar to pushups, planks only need minimal space to complete. ...
- Sit-ups – As a staple in many fitness routines, sit-ups are a great workout to strength your core.

Slide 10 – Truck exercises

Time permitting, show this video demonstrating exercises.

The Healthy Trucker workout – 17 ways to exercise with the truck (4:21)

https://youtu.be/mKMC63ysO9w

www.Healthytrucker.net

Optional extension activities:

1. In groups, have students research and develop a 20-30 minute exercise routine they can do while in or near their truck. Have each group share their exercise routine. This is a great assignment to connect to a coffee or lunch break to get students up and moving. Each group could share their ideas or run a fitness session on a different day.

2. Encourage students to download a fitness app and log their physical exercise for one week.

Workplace hazards

Time required: 30 minutes

Introduce the topic – According to WorkSafeBC, falls from height are the third leading cause of workers compensation claims after over exertion and motor vehicle incidents. Most falls occur when the driver

- exits or enters the cab (37 percent)
- conducts vehicle inspections, maintenance and repairs (18 percent)
- unloads cargo (14 percent)

Slide 11 – Falls

Video - WorkSafeBC – Arvind's story (3:24)

Introduce and show this video on the consequences of exiting the cab incorrectly.

Meet Arvind: Part-time farmer, long-haul truck driver, hockey dad. Watch what happens when his life takes a bad turn after he falls while exiting the cab of his truck.

https://www.youtube.com/watch?v=1zP1qi8-N_o

Slide 15 – Three points of contact

Video - Three points of contact: Be safe (1:26)

Show this short video demonstrating getting into and out of a truck using three points of contact.
https://www.youtube.com/watch?v=bp9TAZhU0FY

Outline full procedures and tips:

- Enter and exit facing the cab
- Climb up and down slowly

- Mount and dismount only when equipment is stopped
- Look for obstacles on the ground before exiting the vehicle
- Break three-point contact only when you reach the ground, cab or platform
- Take extra care in wet, snowy or icy weather
- Avoid wearing loose or torn clothing that can catch on equipment
- Wear shoes with appropriate support and traction.

Briefly discuss other fall scenarios at this point or in the yard with appropriate demonstrations.

Ergonomics

Slide 13

Ergonomics relating to vehicle design can include things like seat position, design and placement of controls and displays, and vehicle noise and vibration.

Discussion - Review tips in the student guide for preventing discomfort from sitting for long periods.

Video - Watch the video from WorkSafeBC identifying things truck drivers can do before they start work to reduce the risk of back injury.

WorkSafeBC: Ergonomics for Truckers (2:43)

https://www.youtube.com/watch?v=ZHO_EThsKps&feature=youtu.be

Hazardous substances

Slide 14

Review the WHMIS (Workplace Hazardous Materials Information Systems) information in the student guide.

Key points:

Carbon monoxide, fuel and battery acid are some of the gasses, fuels and fluids that pose hazards

Carbon Monoxide (CO) is a colorless, odorless, toxic gas that is a product of incomplete combustion. Most fatal unintentional carbon monoxide poisonings associated with motor vehicles are preventable and can result from:

- Operating with a damaged or malfunctioning exhaust system and an inadequately ventilated passenger compartment.
- Running a motor in a garage with inadequate ventilation.
- Use of auxiliary fuel-burning heaters inside the vehicle.

Prevent exposure - Have a battery operated carbon monoxide detector in your cab that sounds an alarm when CO levels are too high.

Driver protection devices and equipment

Slide 15

Video - Donna's Story: Delivery Truck Driver Safety (3:22)

Meet Donna: Mom, delivery truck driver, amateur tennis player. Watch what happens when her life takes a bad turn after she's struck by a pry bar while securing a load.

https://www.youtube.com/watch?v=WTGsueqPP3s

Discuss importance of seatbelts, airbags and head restraints.

- Discuss the importance of dressing for protection.
- Wear sturdy work boots or shoes instead of flip-flops.
- Use examples of safety equipment, such as eye protection, aprons, hearing protection, and various types of gloves.
- Stress the hazards wearing jewelry could cause on the job.
- Discuss how some loads may require special equipment such as hard hats, dust masks, coveralls, and respirators.
- Identify danger zones for professional drivers—from the cab to the coupling and from the trailer to the dock.

- Discuss how to protect yourself on the dock. Talk about common hazards involved with loading and unloading freight.
- Discuss dressing for weather and the variance in conditions around the Province. Exposure to extreme heat can cause heat stroke and dehydration and extreme cold can cause hypothermia and frostbite. Under certain conditions, both can cause death.

Driver's rights and responsibilities for safety

Slides 16-18

Review the information on the slides and the importance of reporting workplace safety concerns.

Wrap up the workplace hazards section with a few debriefing questions before moving on.

Workplace conflict and violence

Time required: 20 minutes

Slides 19 - 20

Provide an introduction to the topic and give the assignment.

In a later lesson, have a discussion using the questions.

Slide 19 – Workplace conflict and violence

Introduce the topic

- More than 60,000 workers per day are harassed or are the victims of workplace violence
- On a daily basis 43,800 employees are harassed; 16,400 threatened, and 723 workers are attacked.

Give the homework assignment:

Read the handout ***It's time to end workplace violence*** and answer the questions in your workbook.

- What should you do if you encounter workplace violence?
- What steps can you take to protect yourself and avoid dangerous situation? (have a check in procedure with dispatch, avoid dangerous parts of town at night, park in well lite areas)

The entry was posted in *Health & Wellness, News* on November 5, 2018.
Source: bcfed.ca

See article in student workbook.

Slide 20 – Road rage

Ask the class: has anyone been the victim of road rage?

Part 1 - In groups, briefly share your story. What did you do? How did that make you feel?

Part 2 – In their groups, have students read and discuss the information on road rage in their student guide.

Tie back to the fact that if we are tired or stressed, we have less patience. This can affect how we react to events.

Slide 21 – Aggression management

Review aggression management technique: Stop, Drop and Process outlined in the student guide.

Optional lessons and activities

Relaxation techniques

These quick activities can fit into any point in the course to introduce students to these relaxation techniques.

Explain that stress and anxiety can be a part of a professional driver's job. Deep breathing, meditation and progressive muscle relaxation are techniques that can help reduce stress and anxiety levels. They are also a good way to help fall asleep.

Have the students practice the two following relaxation techniques at different points in the course.

Deep breathing

The simplest deep breathing technique is the 5-2-8 breathing technique, breathing in through your nose for 5 counts, holding for 2 counts and exhaling through your nose for 8 counts.

Progressive muscle relaxation

Practice progressive muscle relaxation with the students.

Sit and make yourself comfortable. (At home you can practice the technique laying down and stretching out). Unfold your arms and uncross your legs so that you have easy circulation and your body is able to really relax.

Start with your face. Begin by tensing all the muscles in your face and scalp. Make a tight grimace, close your eyes as tightly as possible, and clench your teeth. Hold this for the count of eight as you inhale.

Let go of your tension. Now exhale and relax completely. Let your face go completely lax, as though you were sleeping. Feel the tension seep from your facial muscles and enjoy the feeling.

Move to your neck and shoulders. Next, completely tense your neck and shoulders, again inhaling and counting to eight. Then exhale and relax.

Work your way down. Continue down your body, repeating the procedure with the following muscle groups:

- chest
- abdomen

- entire right arm - right forearm and hand (making a fist)
- entire left arm - left forearm and hand (again, making a fist)
- buttocks
- entire right leg
- entire left leg
- repeat: face, neck, shoulders, and arms and so on

References

Healthy Trucker

www.Healthytrucker.net

Selkirk College – Fit to Drive Program

https://selkirk.ca/fittodrive/program-synopsis

Relaxation techniques

Verywellmind.com – Reduce tension with progressive muscle relaxation

https://www.verywellmind.com/reduce-tension-with-progressive-muscle-relaxation-3144608

Workplace violence

B.C. Federation of Labour www.bcfed.ca/campaigns/endworkplaceviolence

Workplace communication

Unit overview

Part of framework Module 1 – Overview of the trucking industry

In this unit students will discuss the basic skills needed for workplace communication. To become successful professionals, drivers must be able to communicate clearly and correctly to co-workers, supervisors, customers, suppliers, enforcement officials and the general public.

This lesson has a number of activities that could be spread out throughout the course rather than teaching as a continuous unit.

Total time: 60 minutes

Plus optional lesson, if desired.

Materials required

- Communication style quiz
- List of non-verbal behaviours for role play (body language activity)
- Audio/visual equipment
- Slide presentation.

Learning outcomes from the MELT framework

1.2. Effectively interact and speak with coworkers, supervisors, customers, suppliers, enforcement officials, and the general public.

1.2.1. Explains that interactions involving spoken words include specific words as well as the accompanying tone of voice, context, gestures and body language.

1.2.2. Describes gestures and body language that convey messages without exchanging spoken words.

1.2.4. Practices sensitivity to cultural, ethnic, and gender diversity, and uses a gentle and careful approach when encountering any misunderstanding.

6.1.5. Uses electronic and communication devices common in commercial vehicle operations.

Introduction

Slides 1-2

Introduce the lesson.

Communication styles

Time required: 30 minutes

Slide 3

Discussion

- Ask the students what they already know about effective communication.
- Do they know someone who is a good communicator? What makes them a good communicator? (For example, someone who asks questions and is a good listener).
- Do they know someone who is not a good communicator? What do they do that isn't effective? (For example, they interrupt, express their own thoughts or offer advice without listening fully.)
- What questions could you ask someone to fully understand what they are attempting to communicate?

Activity – Communication styles

Slides 4 - 6

Everyone has their own communication style. Researchers have categorized these styles into four areas:

- passive
- passive-aggressive
- aggressive
- assertive.

What's your primary communication style?

Have the students, individually, determine their communication style by completing the activity in their workbook. Their results need not be shared with others. Give them 5-10 minutes.

When they are finished, they should add up the total number of A's, B's, C's, and D's and check their responses with the scoring guide.

Communication style scoring guide

Take your highest score and match it with the communication style.

- Mostly A's: Your primary communication style is passive
- Mostly B's: Your primary communication style is passive-aggressive
- Mostly C's: Your primary communication style is aggressive
- Mostly D's: Your primary communication style is assertive

Note: If you have two scores that are high and very close in number, this means you probably use both styles as needed, usually choosing the communication score with the highest score first.

Briefly discuss what the students noticed about each of the four styles.

Which style would provide the clearest and most respectful communication? (Hopefully students will agree that assertive is the way to go!)

How to become an assertive communicator

Understanding how others communicate can be key to getting your message across to them. In order to develop a more assertive communication style, here are a few tips to keep in mind:

- Take ownership (use “I” statements)
- Maintain eye contact
- Learn to say “no”
- Ask questions
- Listen
- Voice your needs and desires confidently.

Barriers to communication

Time required: 20 minutes

Slides 7 - 9

Reference: Barriers to communication, Student Guide

Barriers to communication

Slide 7

Display the slide and briefly discuss each point using questions to the students.

Gender inclusive language

Slides 8-9

Introduce the activity.

In pairs or triads, have students complete the gender inclusive language activity in their workbook.

After the activity, have students share their results then use **Slide 9** for additional ideas.

Explain that the use of “they” instead of “he” or “she” is now considered acceptable and, in fact, sometimes preferable when referring to a person.

Ask: Has anyone discovered you’ve been using gendered language? Would you be willing to share?

Gender inclusive language ideas

Review the list of gendered and gender-neutral nouns. Does the list surprise you? How often in your daily conversations do you use gendered terms?

Gendered noun	Gender-neutral noun
actress	actor
anchorwoman, anchorman	anchor
man-made	machine-made, synthetic, artificial
flag man	flagger
businesswoman, businessman	business person
chairwoman, chairman	chair, head, chairperson
fireman	firefighter
mailman	mail carrier, postal worker
policeman	police officer
saleswoman, salesman	salesperson, sales attendant
stewardess, steward	flight attendant
waitress	waiter, server
man	person, individual
mankind	people, human beings, humanity
handyman	fixer, maintenance person
housewife	homemaker

Listening well

Slide 10

Discuss the importance of being a good listener.

Brainstorm activity – either in small groups or with whole class.

What can you do to make sure you listen well? Briefly discuss.

Some possible answers:

- Stop talking
- Eliminate distractions
- Move to a quiet place
- Ignore distractions you can't eliminate
- Recognize and tune out personal bias
- Focus on the speaker's problems rather than your own
- Use tone of voice and body language that shows you are listening
- Hear the person before assessing what they have to say
- Focus on the content of the message rather than on the speaker or their communication style
- If the speaker has an accent different from yours, it can be helpful to look at their mouth when they are talking.

Classroom activity – Body language role play

Time required: 10 minutes

Prepare behavior cards in advance.

Slide 11

Ask students: How can one's body language affect your communication with another person? Discuss briefly then do the role play activity.

Explain the activity below:

Divide the students into groups of 3-5. On paper or recipe cards, write out a list of non-verbal behaviors and give it to one person in each group. That person will role play the nonverbal behaviors to their group, for a minute or two, while everyone else in the group shares what nonverbal message they are receiving.

Non-verbal behaviors on the list could include:

- Leaning back in a chair with arms crossed
- Leaning forward in a chair with hands on lap
- Smiling
- Frowning
- Smirking
- Yawning
- Nodding
- Resting chin in both hands
- Rubbing temples
- Tapping fingers on the table
- Looking at a watch
- Staring around the room
- Rolling eyes
- Looking at their phone
- Doodling

Afterward, ask students to share their findings. Discuss.

Ask if anyone has ever experienced a nonverbal cue that was much stronger than any words?

If not brought up earlier, ask for examples of how body language may differ between cultures.

Ask: How can we become more aware of the signals we are sending to others?

Using communication technology

Time required: 15 minutes

Slides 13 - 21

Either teach this topic in class or give students a reading assignment for at home and ask them to complete the questions in their workbook, then review the answers to the questions in a later session.

Using communication technology review quiz - answer key

1. What are three do's of courteous cell phone use?

Answer – any three of:

- Pull over to make your calls, when possible
- Maintain a three metre zone around yourself while talking on a cell phone
- Keep calls brief and to the point
- Tell the person at the other end where you are or what you're doing, so they can anticipate distractions or problems talking to you
- If your on speaker and you're not alone, inform the caller that others are present.

2. What are three don'ts of courteous cell phone use?

Answer - any three of:

- Don't subject other people around you in a confined space (small room, elevator, etc.) to your conversation. Wait until you can be in a quiet, private location
- Don't set your cell phone ringer and tone to a loud, annoying tune
- Don't dial while driving. Use voice activated dialling or pull over to make that call
- Don't take a personal call when you're discussing something with a customer

- Don’t have emotional conversations in public.

3. What are three tips for leaving an effective voice mail message?

Answer - any three of:

- identity yourself
- leave your number
- be clear and concise
- speak slowly
- say when you need a response by
- indicate when you can be reached

4. What are three points for good e-mail etiquette?

Answer - any three of:

- be concise and to the point
- check spelling and grammar
- answer as quickly as you can
- don't attached big unnecessary files
- don't over use flagging options
- don't use all capitals
- read messages before sending
- use meaningful subject lines
- don't send jokes without getting permission first

Optional lesson – customer service

This topic is not a mandatory topic in MELT but does provide value-added learning for students. There is information about customer service in the student guide.

Time permitting, you could cover this topic in class using the student guide or assign students homework to read the information and answer the questions in their workbook. Review the answers at any appropriate time during the course.

Customer service review quiz – answer key

1. What are three errors to avoid when dealing with customers?

Answer - any three of:

- saying "don't know" rather than "I don't have the answer but I'll find someone who does and get back to you"
- being brusque and hurried- saying "hold on" on the phone, for example, rather than "can you please hold tor a moment?"
- indicating that you don't really care about the problem - you need to get going to your
- next stop
- giving orders- "you'll have to ... "
- rudely demeaning customers who don't have all the information, making them feel stupid
- showing prejudice
- conveying through verbal and non-verbal signals that you don't like the customer
- not respecting the customer's time constraints
- leaving out the thank you.

2. What are three phrases that lead to good customer relations?

Answer - any three of:

- how can I help solve this problem?
- thank you
- I don't have the answer, but I will get the information
- we made a mistake
- we appreciate you telling us
- I'm concerned about your complaint.

3. What are five things customers want from you?

Answer

- to be treated as you would treat a guest
- to have your attention
- to be served by a system that works for them, not against them
- to be spared embarrassment
- to be treated with dignity

4. How can you deal with the following "difficult customers"?

- The quiet but angry person
- The whiner
- The shouting person

Answer

- The quiet but angry person - ask questions to get the person talking and then deal with the situation once you know what the details are.

- The whiner - ask this person for solutions to the problem so that you can offer better service that meets his or her needs.
- The shouting person - let this person finish and then ask questions that show you've been listening; state the problem and what you can or can't do about it.

5. How can you handle the customer who has a bad impression of your company based on service provided by someone else (another driver, an accounts representative)?

Answer

- Handle this situation with tact.
- Don't speak ill of your company or the people who work for it.
- Offer to provide better service in the future.
- Offer to take concerns back to someone in the company and follow up on whether that person contacted the customer.

Practical training connection

At an appropriate time during driving lessons or in the yard, demonstrate and have students practice using the communication technology available in the trucks you are using.