Driving a Heavy Vehicle

10th Edition

Includes new *Highway Safety Code* measures

Temporary courtesy version

Québec

Driving a Heavy Vehicle

Québec

Introduction

Sharing the road calls for courtesy and mutual respect on the part of all road users. As a professional driver at the wheel of a heavy vehicle, you need to know what your rights and obligations are, but it is equally essential that you be aware of the importance of adopting safe, cooperative and responsible behaviour.

This guide provides an overview of the standards and rules of conduct that apply to driving a heavy vehicle. Although primarily intended for those who are in the process of learning to drive this type of vehicle, it also serves as a reference document for all heavy vehicle drivers. Its eight chapters present the principal obligations of heavy vehicle drivers, describe certain driving techniques and provide information about the safety standards heavy vehicles must meet.

Visit the website of the Société de l'assurance automobile du Québec (saaq.gouv.qc.ca) to find out more about road safety and its requirements. For any reference of a legal nature, you can consult the Highway Safety Code and its attendant regulations.

Table of Contents

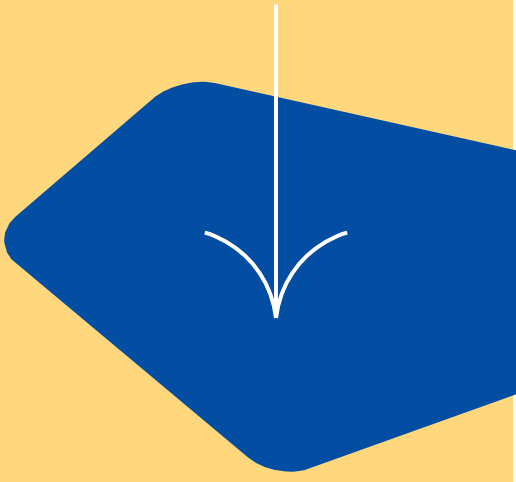
How to use this guide

The following symbols will help you use this guide more effectively.

Symbol	Meaning
	**IMPORTANT!** Important safety information
	**THINK ABOUT IT!** Things to think about that will help you become a competent driver
	**TOOLBOX** Additional information on the subjects covered
	**EXERCISES** Exercises to test and apply what you have lear

Chapter 1

1 The Heavy Vehicle Driver Profession



Heavy Vehicle Drivers

Heavy vehicle drivers mainly drive road vehicles used to transport passengers or goods (also called “cargo” or “freight”), such as trucks, buses, motor coaches, road trains and semi-trailers. These vehicles usually travel on public roads, including city streets and regional, provincial and international roads and highways. However, some heavy vehicles may also be used outside of the public road network.

Heavy vehicle drivers usually work for freight or passenger transportation companies, manufacturing or distribution companies, or driver staffing agencies. In certain cases, they may also work as self-employed owner-drivers or brokers.

In Québec, the transportation industry represents approximately:

- 57,000 heavy vehicle owners and operators;
- 250,000 professional drivers;
- 175,000 buses, tool vehicles and other heavy vehicles.

Around 15 million trips are made on Québec roads every year by heavy vehicles in the transportation industry.

This industry can be divided into two main fields of activity: the transportation of goods and the transportation of passengers. Both fields of activity can be further subdivided based on category and sector.

Transportation of Goods[1]

Heavy vehicle drivers who transport goods must always drive safely. They also have several important tasks they must complete before heading out on the road, during their trip, and at the end of their work shift.

These tasks include planning their itinerary, performing a complete inspection of the vehicle they will be using, picking up or delivering goods in accordance with their employer's instructions, following the applicable protocols for returning the vehicle and complying with the rules governing hours of driving and rest.

A driver's first concern while carrying out these activities must always be the integrity of the goods they are transporting, compliance with all applicable regulations and, above all, road safety.[2]

The transportation of goods can be divided into several categories and sectors. To help you understand the different avenues available, a few important definitions are provided below.

Transportation categories

The transportation of goods can be divided into three main categories: local transportation, regional transportation and long-haul or international transportation. Some transportation companies specialize in one category, while others can cover two or even all three categories.

1 Local transportation

This category mainly consists of deliveries made a short distance from the home terminal. Drivers are often required to handle goods and make frequent stops over the course of the day. They return to the home terminal at the end of the day.

2 Regional transportation

This category is characterized by longer distances and involves very few stops and little handling of goods. Drivers also return to the home terminal at the end of the day.

3 Long-haul or international transportation

This category mainly involves long trips that often require drivers to cross a border or to stop in order to sleep. The number of deliveries and pickups is limited given the amount of time spent on the road.

Transportation sectors

The transportation of goods can be further broken down into six sectors based on the origin or destination of the goods, the link between the goods and the carrier, and the services provided by the carrier. The six sectors are the following: the general sector; the distribution sector; the manufacturing sector; the construction sector; the municipal, provincial and federal government sector; and the driver staffing agency sector.

1 General sector

In this sector, carriers haul goods on behalf of a third party (this is the case for courier companies, for example). They may provide local, regional or long-haul or international transportation services.

2 Distribution sector

This sector typically includes the transportation divisions of major retail chains. Their main role is to ship goods from the chain's distribution centre to the various points of sale. Transportation may be local or regional and sometimes even long-haul or international, depending on the territory served by the retail chain.

1 For more information, refer to the report prepared by the Ministère de l'Éducation on the transport truck driver profession in October 2022, titled *Rapport d'analyse de profession, Conductrices et conducteurs de camions de transport* (in French only).

2 Refer to the report prepared by the Ministère de l'Éducation on the transport truck driver profession in October 2022, titled *Rapport d'analyse de profession, Conductrices et conducteurs de camions de transport* (in French only).

3 Manufacturing sector

This sector involves the shipment of goods by a company that has a factory where it manufactures or processes products (e.g., a paper or corrugated cardboard company). Transportation may be local, regional, long-haul or international.

4 Construction sector

The construction sector generally uses heavy vehicles in local transportation. Concrete mixers, dump trucks and flatbed delivery trucks are examples of heavy vehicles used in this industry.

Manufacturers, distribution companies and construction companies can sometimes hire third-party carriers to serve more remote regions. Examples include the transportation of forestry or mining products on remote roads, as well as the transportation of various products in the agrifood sector (grain, milk, livestock, and so on) in outlying areas.

5 Municipal, provincial and federal government sector

This sector employs many drivers. Governments have large fleets of heavy vehicles that serve mainly to maintain public roads and infrastructure. These fleets are usually used in more local transportation.

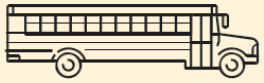
6 Driver staffing agency sector

Driver staffing agencies have been around for a long time and serve companies experiencing a labour shortage or that have specific needs. The role of these agencies is to provide qualified drivers that meet specific needs and requirements. Drivers may be hired to provide local, regional, long-haul or international transportation.

Transportation of Passengers

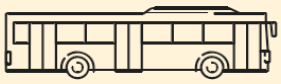
Transportation of passengers using buses that can carry more than 24 passengers is divided into three sectors: school transportation, urban transit and intercity transportation. To give you a better understanding of the differences between these three sectors, a brief description of each is provided below.

School Transportation



This sector involves the transportation of schoolchildren and is mainly local in nature, except in the case of school outings. School buses can also be used for other purposes, such as providing transportation for a sports team or workers. When providing this type of non-school-related transportation, school buses are required to display a sign that bears the word “Spécial” and the rules specific to the transportation of schoolchildren do not apply.

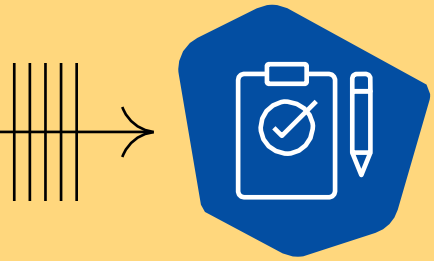
Urban Transit



Urban transit is a means of public transportation specific to a city or an agglomeration that is adapted to its urban layout and environment. This type of local transportation also includes paratransit services.

Intercity Transportation

This sector includes local, regional and long-haul or international passenger transportation provided through chartered services. Often used by sports teams and travel groups, chartered intercity transportation can cover a large territory. The intercity transportation sector also includes public intercity transit services between municipalities and major urban areas.



Exercise 1.1

Do some research to find examples of businesses, carriers, or government departments or ministries (as applicable) that operate in each of the transportation sectors listed below. Enter your examples in the table.

Transportation Sector	Examples
General Carriers that haul freight for various clients	
Distribution Businesses that transport merchandise to be sold in their retail outlets	
Manufacturing Businesses that haul goods manufactured in their factories	
Construction	
Driver staffing agency	
Provincial or federal government (departments or ministries)	
Municipal government (departments)	

Driver's Licence

In Québec, there are three main heavy vehicle licence classes. Class 1 authorizes you to drive a combination of road vehicles. Class 2 authorizes you to drive buses designed to carry more than 24 passengers. Class 3 authorizes you to drive straight-body trucks.

Class 1

A Class 1 licence authorizes you to drive a combination of road vehicles. In other words, you may drive:

- a double-axle truck tractor with a net mass of 4,500 kg or more hauling one or more trailers or semi-trailers;
- a triple-axle truck tractor hauling one or more trailers or semi-trailers;
- a truck covered by Class 3 hauling a trailer or semi-trailer with a net mass of 4,500 kg or more that is only used to transport the machinery, implements or fixtures with which it is permanently equipped;
- a truck covered by Class 3 hauling any trailer or semi-trailer other than those described above, with a net mass of 2,000 kg or more.

If you hold a Class 1 licence, you may also drive vehicles covered by all other licence classes, except for motorcycles (which are covered by Classes 6A, 6B, 6C and 6E).

Class 2

A Class 2 licence authorizes you to drive a bus designed to carry more than 24 passengers, as well as vehicles covered by all other licence classes, except for:

- combinations of road vehicles (Class 1);
- motorcycles (Classes 6A, 6B, 6C and 6E).

Class 3

A Class 3 licence authorizes you to drive:

- a double-axle truck with a net mass of 4,500 kg or more;
- a truck with three or more axles;
- either of the above trucks that is hauling:
  - a trailer or semi-trailer with a net mass of less than 4,500 kg that is only used to transport the machinery, implements or fixtures with which it is permanently equipped,
  - a trailer or semi-trailer with a net mass of less than 2,000 kg.
- a truck tractor with three axles or more, or with two axles and a net mass of 4,500 kg or more, provided it is not hitched to a trailer or semi-trailer.

If you hold a Class 3 licence, you may also drive vehicles covered by all other licence classes, except for:

- combinations of road vehicles (Class 1);
- buses designed to carry more than 24 passengers (Class 2);
- motorcycles (Classes 6A, 6B, 6C and 6E).

Endorsements

To drive some types of heavy vehicles, you must also obtain an endorsement (in addition to your Class 1, 2 or 3 driver's licence). Endorsements appear on your licence (next to "*Mention(s)*").

F endorsement

If you hold a Class 1, 2 or 3 licence, the F endorsement authorizes you to drive heavy vehicles equipped with an air brake system. To obtain this endorsement, you must pass the required knowledge and road tests.

M endorsement

If you hold a Class 1, 2 or 3 licence, the M endorsement authorizes you to drive heavy vehicles equipped with a manual (standard) transmission. To obtain this endorsement, you must pass the required road test.

T endorsement

If you hold a Class 1 licence, the T endorsement authorizes you to drive long combination vehicles (road trains that are more than 25 metres long). To obtain this endorsement, you must have held a Class 1 licence for at least five years and successfully complete special training. Note that long combination vehicles also require a special travel permit.

The T endorsement is required to drive long combination vehicles (road trains over 25 m long).

Additional requirements

Specialized mandatory training is required for some types of transportation, such as school transportation and the transportation of dangerous substances. You will be issued a certificate if you successfully complete the required training.

A certificate of competence is required to drive a bus or minibus used to transport schoolchildren.

A training certificate is required to transport dangerous substances.

Conduct records

Heavy vehicle drivers

As a heavy vehicle driver, not only do you have the same driving record the SAAQ maintains on every other Québec driver's licence holder (in which it enters any offences you are convicted of, along with the corresponding number of demerit points), but you also have a conduct record, which is a record the SAAQ maintains specifically on heavy vehicle drivers.

Your heavy vehicle driver conduct record keeps track of all events you are involved in while at the wheel of a heavy vehicle. The types of events entered in your conduct record include any offences you commit (not just those that result in demerit points), along with any accidents you are involved in and any licence suspensions and fatigue-related "driver" out-of-service orders you receive. It is important to note that as part of its ongoing conduct review, the SAAQ immediately takes every offence it is informed of into consideration, even if you have not yet been convicted of the offence (or have not yet paid the fine or entered a guilty plea).

Every event in your conduct record is assigned a weighting from 1 to 6 based on its severity, and entered in one of four distinct conduct areas. Each conduct area is assigned a threshold value, which is the number of points that must not be reached. The *Conduct Review Policy for Heavy Vehicle Drivers* sets out the rules that govern conduct review and intervention procedures.

- Conduct Review Policy for Heavy Vehicle Drivers

You can obtain your heavy vehicle conduct record the same way you can get a copy of your driving record: by contacting the SAAQ or using the SAAQ's online services.

Heavy vehicle owners and operators

The SAAQ also keeps a conduct record on every heavy vehicle owner and operator (HVOO). Any events entered in your heavy vehicle driver conduct record are also entered in the conduct record of your HVOO. In addition to the events associated with its drivers, offences committed by HVOOs themselves and observed during facility audits and roadside inspections are also entered in their conduct record. As with drivers, all events are assigned a weighting and entered in one of six conduct areas, with threshold values (the number of points that must not be reached) set for each conduct area. The rules that govern HVOO conduct review and intervention procedures are provided in the *Conduct Review Policy for Heavy Vehicle Owners and Operators.*

Conduct Review Policy for Heavy Vehicle Owners and Operators

HVOOs can obtain a copy of their conduct record by contacting the SAAQ or using the SAAQ's online services (SAAQclic Entreprises).

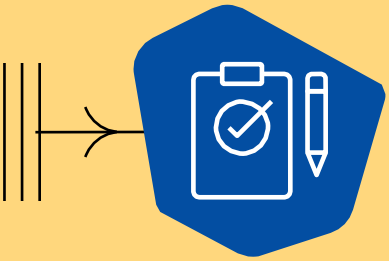
Note that if you are an owner-operator in addition to being a heavy vehicle driver, that makes you both a driver and an HVOO. In that case, you have three records: your driving record, your heavy vehicle driver conduct record and your HVOO conduct record.

Obligations, rights and responsibilities of drivers

When it comes to road safety and the integrity of the road network, as a heavy vehicle driver, you must obey the laws and regulations made by Québec's provincial and municipal governments. When outside Québec, you must obey the laws and regulations that apply in the jurisdiction you are driving in.

You must make sure that your driver's licence is valid and of the appropriate class for the heavy vehicle you are driving, and that it bears any required endorsements. You must also abide by any conditions your licence comes with. The following are some of the main pieces of legislation and standards you must comply with:

- the *Highway Safety Code*;
- the *National Safety Code*;
- the *Act respecting owners, operators and drivers of heavy vehicles*;
- the *Regulation respecting licences*;
- the *Regulation respecting the hours of driving and rest of heavy vehicle drivers*;
- the *Regulation respecting safety standards for road vehicles*;
- the *Cargo Securement Standards Regulation*;
- the *Regulation respecting environmental standards for heavy vehicles*;
- the *Transportation of Dangerous Substances Regulation*;
- the *Vehicle Load and Size Limits Regulation*;
- the *Criminal Code*.



Exercise 1.2

Before going any further, please answer the following questions about your preferences and personality. We will come back to your answers at the end of this chapter, once you have a better idea of what driving a heavy vehicle is all about and can better assess whether this profession is a good fit for you.

Question	Answer
Do you like travelling and exploring, or heading off on trips for long periods of time? Please explain your answer.	
Do you appreciate the comforts of home?	
Are you more of a social or solitary person?	
Do you like working with the public?	
Do you deal well with pressure? Please give an example.	
Does obeying laws and regulations come naturally to you?	
Are you patient?	
Do you like physical work?	
Do you prefer having a routine or undertaking new challenges?	
What is your family situation (marital status, any children and their ages, and so on)?	
What is more important to you, how much money you will be making or the quality of the equipment you will be working with? Please explain your answer.	
Can you handle repetitive work, such as going from point A to point B several times a day?	

Exercise 1.3

Qualities employers look for[3]

Freight transportation companies in Québec were asked about the qualities they look for when hiring heavy vehicle drivers. In your opinion, what qualities do these employers look for most? Place the following qualities in order of importance from 1 to 10, with 1 being the most important.

Good physical condition	
Technological skills	
Computer skills	
Bilingualism/Functional English skills	
Independence	
Good communication skills	
Speed of execution/Efficiency	
Being a safe driver/Having a good driving record	
Calm/Resistance to stress	
Thoroughness	

The answer key is provided at the end of this guide.

3 CAMO_ROUTE. Groupe DDM. Impact des nouvelles technologies dans les professions de transport routier de marchandises. 2022.

Heavy Vehicle Driver Job Description[4]

The tasks listed in the table below reflect your main duties as a heavy vehicle driver. Each task has a clear beginning and end. It is important that each task be structured, carried out autonomously and observable.

The steps listed in the table below describe the actions involved in carrying out a task and show how to accomplish the desired result. They are specific to the task and interconnected.

Table of tasks and steps

The table of tasks and steps presented in this section reflects the consensus arrived at among the truck drivers consulted. Most of the tasks and steps listed here were taken into account when drafting the SAAQ's Class 1 Road Safety Education Program. They are identified with an asterisk (*).

Tasks and Steps		
1. Planning the trip	1.1 Check your assignment* 1.2 Check the required documents* 1.3 Check all details regarding the trip (cargo, destination and so on)*	1.4 Plan your itinerary* 1.5 Check the required equipment*
2. Inspecting the truck and trailer	2.1 Clear the truck or trailer of any snow* 2.2 Perform a circle check of the truck* 2.3 Hitch the trailer	2.4 Perform a circle check of the trailer* 2.5 Fill out and sign the inspection report*
3. Driving the truck	3.1 Perform driving manoeuvres* 3.2 Adapt your driving to road, weather and other conditions* 3.3 Anticipate manoeuvres to be performed* 3.4 Modify the itinerary, as required* 3.5 Communicate with the client or dispatcher, as required	3.6 Perform checks on an ongoing basis* 3.7 Perform periodic checks 3.8 Communicate with the appropriate person in the event of a mechanical breakdown* 3.9 Fill out the record of duty status*
4. Delivering or picking up goods	4.1 Identify the destination 4.2 Provide customer service 4.3 Obtain any required authorizations 4.4 Make sure the premises are safe 4.5 Back up the truck* 4.6 Wear any required personal protective equipment*	4.7 Follow the cargo loading and unloading procedures 4.8 Check the cargo 4.9 Secure the cargo or check its securement* 4.10 Check weight compliance* 4.11 Move the axles or fifth wheel, as required* 4.12 Clean the trailer's interior for the next load
5. Returning to the home terminal or ending your day	4.1 Notify the dispatcher of your arrival 4.2 Refill all fluids 4.3 Perform end-of-day checks* 4.4 Unload the cargo, if applicable 4.5 Make sure the truck's interior and	4.6 Unhitch the trailer(s) at the appropriat location* 4.7 Follow up with the garage, if required 4.8 Park the truck at the appropriate location* 4.9 Plug in the motor unit, if applicable* 4.10 Fill out the required documents*

4 Refer to the report prepared by the Ministère de l'Éducation on the transport truck driver profession in October 2022, titled *Rapport d'analyse de profession, Conductrices et conducteurs de camions de transport* (in French only).

Knowledge, abilities, and soft skills[5]

Performing the tasks and steps involved in driving a heavy vehicle requires **knowledge, cognitive, physical and sensory skills, and soft skills.**

Knowledge

Laws and regulations

As a heavy vehicle driver, you must be familiar with the *Highway Safety Code* and its attendant regulations, especially with regard to the transportation of goods and passengers, licence class and permit requirements, vehicle registration requirements, traffic rules, road signs, pavement markings and traffic signals, as well as your obligations as a driver, things you are prohibited from doing, and what constitutes an offence. You must also know where to find and how to use the information you need.

If you haul freight in other Canadian provinces or territories, or in the United States, it is important that you be familiar with the laws and regulations that apply in those jurisdictions.

Equipment

It is important that you be familiar with the equipment you are using, which varies depending on the type of heavy vehicle. Such equipment includes the axles (which can vary in type and number), securement equipment, electronic equipment and pneumatic equipment. You must also be able to use this equipment on the road and while freight is being loaded and unloaded.

Mechanics

You must have solid mechanical knowledge in order to perform a circle check of your truck or road vehicle combination. This knowledge will help you identify and locate any problems, assess the severity of a defect, and explain the situation to the person in charge of the vehicle's mechanical maintenance.

Workplace health and safety

Workplace health and safety knowledge is required to drive a heavy vehicle. This includes knowing what safety precautions to take when driving, how to identify and use personal protective equipment, and how to work ergonomically.

The transportation industry

You should be familiar with the transportation industry. While this knowledge is something you primarily acquire on your own and is often a question of general culture, understanding the roles and responsibilities of the various stakeholders in the transportation industry and being familiar with the services offered can make your work easier.

Geography

Basic knowledge of geometry is essential, such as being able to recognize cardinal points and directions and understanding the rules behind the road network numbering system as they apply to primary, secondary and tertiary roads.

French and English

You must be able to speak and write in French. Your work as a heavy vehicle driver requires that you share information with your superiors, colleagues and customers. In some cases, you will have to fill out forms or write documents in French using clear and precise language. French reading skills are also important, as you must be able to read road signs and trip-related documents.

5 Refer to page 40 of the report prepared by the Ministère de l'Éducation on the transport truck driver profession in October 2022, titled *Rapport d'analyse de profession, Conductrices et conducteurs de camions de transport* (in French only)..

Functional English skills are also useful, but the need for such skills may vary depending on the territory you cover. A good grasp of English transportation-related vocabulary and an ability to understand regulations written in English are important when travelling to other Canadian provinces and territories or to the United States.

Transportation logistics

A good understanding of transportation logistics helps you develop loading plans for optimal cargo placement and space usage while taking into account unloading sequences.

Mathematics

You must have basic knowledge in mathematics, so as to perform various calculations pertaining to loads, axial weight, load capacity, volume capacity, fuel autonomy, and so on. You will also often need to convert distances, speeds and temperatures from one system of measurement to another.

Technology

You also need to be sufficiently at ease with technology in order to use various tools, including the following:

- the satellite-based Global Positioning System (GPS) ;
- an electronic logging device;
- an online mapping service (such as Google Maps);
- an online virtual navigation tool (such as Google Street View);
- a smartphone and various mobile apps, including navigation and traffic apps (such as Waze) and messaging apps ;
- technology that is an integral part of the vehicle, such as a touchscreen dashboard, a telematics device or the temperature controls of a refrigerated truck or trailer.

It is therefore important that you understand how these tools work, and that you use and adjust them as required.

Abilities[6]

Cognitive abilities

The cognitive skills listed below are key to the main intellectual tasks you must perform as a heavy vehicle driver:

- planning skills—these skills help you manage transportation logistics, such as planning stops for meals and determining the best time to load or unload your vehicle;
- problem-solving skills—these skills help you deal with various unforeseen events, such as an accident, a mechanical breakdown, or a scheduling or itinerary change;
- analytical skills—these skills help you understand how various systems function and are useful for solving certain types of problems;
- organizational skills—these skills help you with time management and efficiency.

Motor and kinesthetic skills

As a heavy vehicle driver, you need to have good motor and kinesthetic skills, which are related to your ability to perform and control your movements.

The main motor and kinesthetic skills you will use are:

- manual dexterity;
- hand-feet coordination (especially when driving a manual transmission);
- physical endurance and strength;
- balance (when you must climb onto a piece of equipment).

Sensory abilities

Your sensory skills are what allow you to receive and process information from your environment. The following are a few examples:

- **sight**—this allows you to notice things such as mechanical defects and changes in traffic;
- **smell**—this enables you detect odours, including those caused by mechanical defects;
- **spatial perception**—this is useful in carrying out various driving manoeuvres, such as backing up and parking;
- **hearing**—this is useful in detecting mechanical defects;
- **touch**—this allows you to detect things such as vibrations.

6 Refer to page 42 of the report prepared by the Ministère de l'Éducation on the transport truck driver profession in October 2022, titled *Rapport d'analyse de profession, Conductrices et conducteurs de camions de transport* (in French only).

Soft skills[7]

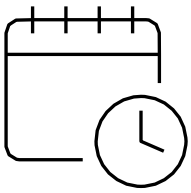
Soft skills are all about how you behave, react and interact with others. They translate into attitudes that reflect your personal and professional values.

When driving a heavy vehicle, your soft skills come into play on both a personal and interpersonal level. They are also reflected in your adherence to ethical standards and in your approach to workplace health and safety.

On a personal level	› Ability to adapt › Organizational skills › Ability to work long hours › Good stress management › Good judgment › Independence
On an interpersonal level	› Good communication skills › Ability to receive constructive criticism › Courtesy at the wheel › Empathy › Good conflict management skills › Respect
Professional ethical standards	› Professional attitude › Honesty and transparency › Respect for confidentiality, especially when posting on social media › Respect for the company's reputation and compliance with its internal directives and the contracts it has entered into with its clients
Workplace health and safety	› Exemplary behaviour and tendency to lead by example › Ability to say no in order to respect your limits › Prudence or the ability to not engage in rash behaviour › Prevention › Sense of responsibility › Ability to seek out confirmation when in doubt

7 Refer to page 42 of the report prepared by the Ministère de l'Éducation on the transport truck driver profession in October 2022, titled *Rapport d'analyse de profession, Conductrices et conducteurs de camions de transport* (in French only).

Work schedule



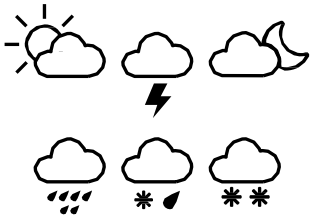
As a heavy vehicle driver, your work schedule will vary based on your employer's needs and the type of transportation. A typical work week is usually between 40 and 70 hours, but some drivers opt to work part time, for a variety of reasons. Regardless of how many hours you work each week, you must comply with the requirements governing driving and off-duty time, which is something we will discuss in greater detail in Chapter 3.

You may work during the day, the evening or at night. You may even split your driving up into two shorter periods during the same day, as your work shift can extend over a 16-hour period. Furthermore, depending on the distance you must travel and your destination, your work week may begin on any day of the week.

Local transportation involves more regular hours, as long as delivery deadlines are met, whereas long-haul transportation gives you the flexibility to organize your work schedule to suit your personal needs and preferences.

Some trips require a minimum amount of time on the road. For example, a return trip to British Columbia can easily take 12 days if you have no co-driver. You can take time off while on the road or when you arrive at your destination. Or you may prefer to take several days off in a row once you are back home. Various options are possible while complying with the *Regulation respecting the hours of driving and rest of heavy vehicle drivers*.

Working conditions

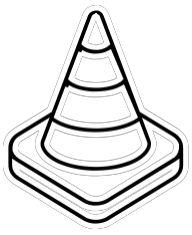


The freight industry operates year-round, with peak periods varying greatly depending on the sector. It is therefore difficult to say when you might have more work or less work, as that will depend on the sector you are working in.

Weather conditions have a huge impact on the transportation industry. When weather conditions are poor or dangerous, traffic is affected. For example, during a snowstorm with reduced visibility, some carriers may tell their drivers not to head out on the road as a preventive road safety measure.

Good overall physical fitness and an ability to adjust and adapt are important when driving a heavy vehicle. You may have to handle goods and use securement devices when making trips. You may also have to deal with an increase in ambient noise while driving or while trying to sleep in your sleeper berth. This can lead to increased fatigue.

Physical fitness also helps you adapt to changes in temperature. Rain or shine, your tasks remain the same, but they can easily take more time in poor weather. For example, when it's cold and windy, you may need more time than usual to install a canvas or strap down your load.



Certain things remain out of your control when heading out on the road, including traffic, roadwork and detours. When unforeseen events occur, you may feel stressed and anxious. It is important to learn how to manage stressful situations while remaining patient and keeping a cool head.

Some heavy vehicle drivers like to work independently because this allows them to better manage their time and choose their routes. Other drivers enjoy the solitude of the road. For others still, the constantly changing scenery and landscapes are a welcome change to office work. The wide range of working conditions and options in the transportation sector means you can find work that suits your needs and preferences, whatever they may be.

Remuneration

As a heavy vehicle driver, you can get paid in a variety of ways. You may be paid by the hour or kilometre, or you may receive a flat rate. Some carriers may allow you to combine two or more of these remuneration options. Note that you are not paid when you stop to rest or to sleep in your sleeper berth. If you work for a company that provides local or regional transportation services, you will generally be paid at an hourly rate. If you work as a long-haul driver, you will usually receive a flat rate, which generally means a per-kilometre rate and a fixed amount for each task you complete, such as inspecting, picking up or delivering your load.

For information on the average hourly rate and yearly wage of heavy vehicle drivers, refer to the Québec government website on trades and occupations in Québec (enter the keywords “transport truck drivers”).

Job prospects and career opportunities[8, 9]

Career opportunities

According to the Ministère de l’Emploi et de la Solidarité sociale, the job prospects for heavy vehicle drivers are very good. There are also numerous opportunities to advance your career. You can become:

- a supervisor;
- a dispatcher;
- a compliance officer ;
- a safety practitioner ;
- the owner of your own transportation business;
- a heavy vehicle driving instructor.

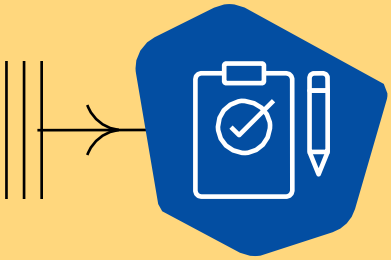
Family life

Working conditions can vary from one company to another. It is therefore important to do your research before accepting a job. Some employers promote a healthy work-life balance, whereas others may provide other perks to their employees.

Choosing an employer carefully based on your preferences and needs will help you find satisfaction in your work.

8 Refer to the report prepared by the Ministère de l’Éducation on the transport truck driver profession in October 2022, titled *Rapport d’analyse de profession, Conductrices et conducteurs de camions de transport* (in French only).

9 Québec.ca, Home/Employment/Learning About a Trade or an Occupation/Exploring Trades and Occupations/Transport Truck Drivers.



Exercise 1.4

Identify transportation companies that appear to be a good fit for your personality, requirements and expectations by looking through various trucking industry publications and browsing the Internet. Explain your choices.

Company	Type of Transportation	Reasons for Your Choice
		1. 2. 3.
		1. 2. 3.
		1. 2. 3.
		1. 2. 3.
		1. 2. 3.

Transportation industry partners[10]

While there are many freight and passenger transportation industry partners, we will only be presenting government partners here.

Société de l'assurance automobile du Québec (SAAQ)

The mission of the SAAQ is to protect individuals against the risks inherent in use of the road and help administer a number of laws and regulations.

The SAAQ is responsible for:

- managing the public automobile insurance plan, setting insurance contribution rates and compensating accident victims;
- managing access to the road network (driver licensing and vehicle registration);
- promoting road safety through awareness campaigns to improve Québec's road safety record;
- helping administer various laws and regulations, including the *Highway Safety Code*.

Ministère des Transports et de la Mobilité durable

The Ministère des Transports et de la Mobilité durable (MTMD) develops policies around transportation services, networks and systems, and presents them to the government. These policies are implemented through the following activities:

- planning, designing and carrying out the construction, improvement, maintenance and repair of the road network, and of any other transportation infrastructures that fall under the MTMD's responsibility;
- providing technical and financial support to municipalities for the maintenance, repair and improvement of the local road network;
- providing support for passenger transportation systems, including urban public transit, paratransit services, and regional marine and air transportation;
- developing and implementing transportation safety programs;
- supporting the freight industry by encouraging intermodal transportation and the use of various modes of transportation (road, rail, marine and air).

10 This is not an exhaustive list of transportation industry partners.
Sources: The websites of the applicable government departments or bodies.

Commission des transports du Québec

The Commission des transports du Québec (CTQ) receives financial support from the MTMD. The CTQ oversees several transportation sectors in order to ensure service quality and availability. Its activities focus on:

- increasing public safety in the road, marine and rail transportation sectors;
- ensuring the integrity of the road network.

Contrôle routier Québec

Contrôle routier Québec (CRQ) is a law enforcement agency that comes under the responsibility of the Minister of Transport and Sustainable Mobility and is affiliated with the SAAQ. Its mandate is to monitor and ensure compliance when it comes to the road transportation of goods and passengers in Québec.

The CRQ is also responsible for preventing and imposing penalties for offences committed under the laws and regulations governing the transportation industry, as well as under any other laws passed by the government with a view to:

- improving the safety of all road users;
- protecting the integrity of the road network;
- monitoring and ensuring compliance when it comes to the road transportation of goods and passengers;
- maintaining fair competition in the goods and passenger transportation industry.

Comité sectoriel de main-d'œuvre de l'industrie du transport routier (Camo-Route)

Camo-Route is a multisectoral road transportation industry body with a collaborative approach that brings together a range of sectoral, regional, employment, industry and education stakeholders. Camo-Route undertakes research and proposes targeted solutions to meet the labour and training needs of businesses and workers.

Its mandates are as follows:

- Identify the human resource and work organization needs of the transportation industry.
- Aim to achieve a more highly skilled work force.
- Make training more readily available across all Québec regions.
- Support the development of continuing education for workers.
- Help businesses save on employee training.
- Ensure greater stability in employment and adequate training of new candidates.
- Foster greater career mobility within businesses through intergenerational knowledge transfer.

Exercise 1.5

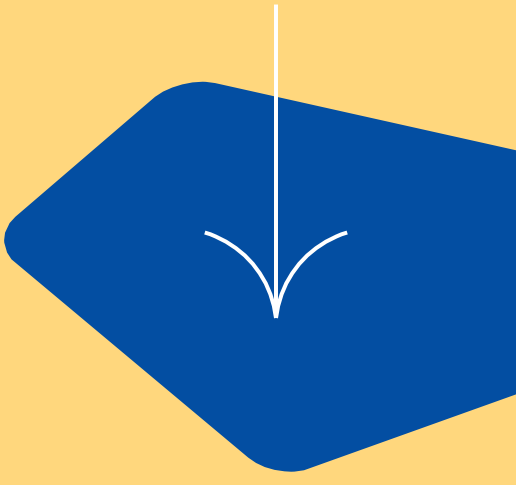
In light of everything you have read in this first chapter, answer the following questions and compare your answers to those you provided in Exercise 1.2.

In light of everything you have learned in Chapter 1, do you think you have the qualities and abilities required to become a heavy vehicle driver?

Which qualities or abilities do you think you would need to develop or improve upon in order to achieve your goal of becoming a safe, cooperative and responsible trucker?

Chapter 2

Heavy Vehicle Characteristics and Components



Heavy Vehicle Configurations

Every vehicle has its own characteristics, but the components used to operate the vehicle, control speed and maintain the vehicle on its course are similar from one vehicle to another.

As a professional driver, it is your responsibility to be very familiar with the vehicle you are driving; otherwise, you may run into serious problems.

This chapter presents the main characteristics of heavy vehicles and how their components work. For more information on the specific vehicle you are driving, please refer to the manufacturer's manual.

Different licence classes based on vehicle configuration

Vehicles travelling on the road network differ both in terms of their configuration and the type of transportation for which they are used. These configurations require different classes of licence.

Main types of vehicles

Tractor semi-trailers (Class 1 licence)


Truck trailers (Class 1 licence)

Double road trains (Class 1 licence and specific training for the T endorsement in the case of long combination vehicles)

City buses (Class 2 licence)


School buses (Class 2 licence and specific training)

Motor coaches (Class 2 licence)


Straight-body trucks (Class 3 licence)



Main characteristics of heavy vehicles

Definition of a heavy vehicle

- Road vehicles with a gross vehicle weight rating (GVWR)[11] of 4,500 kg or more (e.g., road tractors, straight-body trucks, concrete mixers, tank trucks, vans, pickup trucks, well drills, concrete pumps, cranes mounted on a truck chassis, ambulances, fire department vehicles);
- Combinations of road vehicles[12] where at least one of the vehicles has a GVWR of 4,500 kg or more (e.g., a pickup truck and trailer, a tractor and trailer or a tractor and semi-trailer);
- Buses, minibuses and tow trucks, regardless of their GVWR (e.g., motor coaches, paratransit minibuses, school buses, city buses).

11 The GVWR consists of the vehicle's net mass and maximum load capacity. This number specifies the maximum weight the vehicle can reach when loaded to its maximum capacity. The GVWR appears on the vehicle's certificate of compliance.

12 In the case of a combination of road vehicles, if one vehicle has a GVWR of 4,500 kg or more, every vehicle in the combination must be inspected.

Parts of a heavy vehicle

Engine compartment

Body

Cab

Here are examples of load spaces, which vary depending on the freight to be transported.

› General transportation truck

› Single-drop deck flatbed semi-trailer

› Closed semi-trailer

› Tank semi-trailer for transporting dry goods

› Tank semi-trailer for transporting liquids

› Flatbed semi-trailer

› Semi-low loader semi-trailer

› Car hauler vehicle combination

› Flatbed semi-trailer with accordion tarp

› Semi-trailer coupling device

Exercise 2.1

Check off all of the following components that you can identify on the semi-trailer truck made available to you and then identify which type of semi-trailer it is.

Fuel tank and diesel exhaust fluid filler caps	☐
Driver's side auxiliary compartment	☐
Semi-trailer landing gear crank	☐
Semi-trailer suspension and pressure gauge	☐
Semi-trailer sliding bogie locking pins	☐
Hood release mechanism **(exercise caution with hoods that have a safety lock!)**	☐
The semi-trailer's lines, cables and electrical connections	☐
Type of semi-trailer	

Engine Compartment

The engine compartments of heavy vehicles contain several components and systems with which you must become familiar. Some of these components and systems will be covered in greater detail in Chapter 6 on the circle check.

Engine

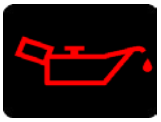
Internal combustion engines use fuel and oxygen in the air to create a controlled explosion inside their cylinders to produce energy. This energy is converted into rotational movement through the crankshaft, and then transmitted to the vehicle's drive wheels via the transmission and the drive shaft. With the various types of fuel and numerous configurations available, engines can operate at various power ratings.

The cylinder capacity of the engines used in heavy vehicles can vary from 7 to 16 litres, depending on the manufacturer. In comparison, most passenger vehicles have a cylinder capacity of 1.3 to 5 litres. This variety means there is an engine suited to every situation. The heavier the loads to be hauled, the more power the engine must be able to produce. Driving through mountainous terrain requires a lot of power, whereas limited-access highway driving is often less demanding. The choice of cylinder capacity has a huge influence on fuel consumption. It is therefore important to choose the right engine for the right job.

You must be familiar with the particularities of your vehicle's engine to use it economically and responsibly. Data on the engine's RPM range can be used to maximize performance while maintaining a minimal RPM and reducing fuel consumption. To achieve such savings, it is best to choose an engine with low operating ranges.

Although checking the oil level is not a mandatory part of the circle check, you should do so before each trip. The quantity, quality and temperature of the oil can affect the engine's oil pressure and lifespan.

In most heavy vehicles, a gauge on the dashboard indicates the engine's oil pressure. In some vehicles, an indicator warning light comes on when the oil pressure is low. Refer to the owner's manual for the minimum oil pressure your vehicle's engine requires. You should also visually inspect the engine to make sure there is no risk of any parts coming off and that no fluids are leaking.



The engine failure indicator lights alert you that you must stop at a safe place (red) or have your vehicle checked (yellow) as soon as possible.

Engine coolant radiator and air intake cooling radiator

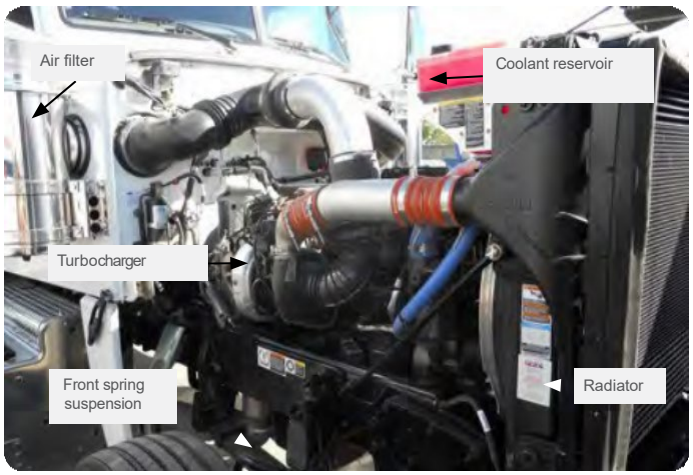
The engine coolant radiator is used to cool the engine. The coolant carries the heat generated by the engine's combustion to the radiator at the front of the vehicle to cool it down. There must not be any leaks from the radiator or the hoses. Coolant is usually red or green. There must always be enough coolant in the expansion tank.

The following examples of indicator lights inform you about the coolant level and temperature.

Low coolant level

Critically low coolant level

Overheating engine



Most diesel engines are equipped with a turbocharger. These types of engines often have a radiator that cools down the compressed air produced by the turbocharger in order to let more air be drawn into the engine's cylinders (cold air is denser than hot air).

Engine intake and exhaust systems

Maintaining the engine intake system in good condition ensures proper engine performance and emission control system efficiency. It includes the following components:

- air filter (1);
- intake hoses(3 and 5);
- compressor (2, in grey);
- intake cooling radiator (4);
- intake manifold (6).

The engine's exhaust system reduces engine noise and processes pollutant emissions to minimize them. It includes the following components:

- exhaust manifold (7);
- turbine (2, in red);
- particulate filter (8);
- exhaust fluid (urea) reservoir (9);
- catalytic converter and exhaust pipe (10).

The indicator lights inform you about the system's condition:

Clogged particulate filter

Excessively hot exhaust system

Low diesel exhaust fluid level

The engine's intake and exhaust systems must be checked and repaired by experienced technicians.

Alternator and batteries

The alternator provides the electricity required to keep the batteries charged at the proper level after starting the engine or when operating the electrical systems and devices, such as lights and headlights, cab ventilation, windshield wipers, etc. It must be securely attached and the drive belt must be properly tensioned and in good condition. The alternator's operation can be monitored using the voltmeter on the dashboard.

Before starting the engine, the alternator should indicate the voltage in the batteries, which should be around 12.6 volts. Once the engine is running, the voltmeter should indicate a slightly higher voltage of 13.7 to 14.1 volts. If this is not the case, you should have the charging system checked out.

Windshield washer reservoir

The windshield washer reservoir should contain enough washer fluid for the wipers to thoroughly clean the windshield throughout the trip.

Air compressor

The compressor provides the compressed air required for the air (pneumatic) brake system, air (pneumatic) suspension and other components that use compressed air to work. The compressor is usually driven by the engine. The compressor will be discussed in greater detail in Chapters 5 and 6, which cover air brakes and the circle check, respectively.

Master cylinder and hydraulic brake fluid reservoir

Vehicles equipped with hydraulic brakes have a master cylinder, which uses the movement of the brake pedal to adjust the hydraulic pressure directed to each of the wheels as the service brake is applied. It is important to check the brake fluid level on a regular basis. This will be covered in greater detail in Chapter 6. Hydraulic brakes will also be discussed later in this chapter.

Clutch fluid reservoir

Vehicles equipped with a manual (standard) transmission have a clutch that is used to shift gears and smoothly make the vehicle go forward, backward or come to a stop. The clutch control mechanism can either be mechanical or hydraulic. A hydraulic system is equipped with a fluid reservoir, the level of which must be checked on a regular basis. Although not all vehicles have a hydraulic clutch control system, it should be checked when there is one.

Exercise 2.2

Indicate whether each of the following statements is true or false.

Statements	True	False
1. The alternator provides the electricity required to keep the battery charged.	◯	◯
2. The particulate filter is a component of the engine's intake system.	◯	◯
3. When the red engine failure light is on, you must stop your heavy vehicle at a safe location as soon as possible.	◯	◯
4. A radiator that cools the air is installed on turbocharged engines.	◯	◯
5. An internal combustion engine uses fuel and nitrogen from the air to operate.	◯	◯

The answer key is provided at the end of this guide.

Types of Transmissions

Several components are used to transmit the engine's power to the vehicle's drive wheels.

From the engine to the wheels, you will find:

- the clutch or torque converter;
- the manual (standard), automated manual or automatic transmission;
- the drive shaft;
- the drive axle (drive bridge) or drive axles (drive bridges) fitted with differentials.

Manual transmissions

There are two types of manual transmissions: synchromesh and non-synchromesh. All manual transmissions, as well as some automated manual transmissions, are equipped with a clutch pedal that is used to engage and disengage the drive force produced by the engine.

Synchromesh manual transmission

A synchromesh manual transmission usually has five or six gears. A synchromesh inside the gear box enables you to shift gears without grinding. This type of transmission is used primarily on school buses and certain double-axle trucks with a low gross vehicle weight rating (e.g., a pickup truck). Using this type of transmission requires a clutch pedal similar to that of passenger vehicles and does not require you to use the double-clutching technique.

Non-synchromesh manual transmission

A non-synchromesh manual transmission is used primarily in heavy vehicles with three or more axles and a high gross vehicle weight rating (including tractor semi-trailers). It usually has eight to 18 gears.

Because it is not equipped with a synchromesh enabling you to shift gears without grinding, you must use the double-clutching technique for safe and efficient driving. Mastering this technique requires a good sense of timing and many hours of practice.

Using a non-synchromesh manual transmission

To use a non-synchromesh manual transmission, you must be familiar with the principal features of your vehicle's engine, clutch pedal and transmission.

Using the accelerator pedal also requires a high degree of dexterity. This technique will be presented in Chapter 4.

Types of non-synchromesh manual transmissions

A number of companies manufacture manual transmissions that each have specific characteristics to meet various conditions of use. The gear shift pattern also varies based on the transmission's configuration.

The following are three main types of non-synchromesh manual transmissions you may come across:

Direct drive transmissions

- These transmissions have two 10-gear ranges.
- They are easy to use.
- They are suitable when loads are very heavy.

Reduction gear transmissions

- These transmissions have 8, 9 or 15 gears and include a gear reducer that increases the power to the wheels at low speed.

Overdrive transmissions

- These transmissions have 13 or 18 gears.
- A 13-gear transmission features overdrive for the upper range only, which can help save fuel at higher speeds, such as when driving on limited-access highways.
- An 18-gear transmission has overdrive for both ranges.

Gear reduction and overdrive work by transmitting power from the engine to the wheels via a network of gears located in the transmission, somewhat like shifting gears on a bicycle.

Gear reduction is used when starting the engine in order to increase power to the wheels. It lets the engine rotate at a higher speed (RPM) than the wheels. Gear overdrive is used while driving on the road to save fuel by letting the engine run at a lower RPM than the wheels.

Clutch

As indicated above, manual transmissions use a friction clutch to couple and uncouple the engine and transmission. It directly transmits the energy from the engine to the transmission input shaft via clutch plates.

Using the clutch pedal

When the pedal is raised in a normal driving position, the clutch is engaged and power is transmitted to the drive wheels via the transmission. When you press down on the clutch pedal, the clutch is disengaged, the engine is uncoupled from the transmission and power is no longer transmitted to the wheels, which is the equivalent of shifting into neutral. Only then can you shift gears with a manual transmission.

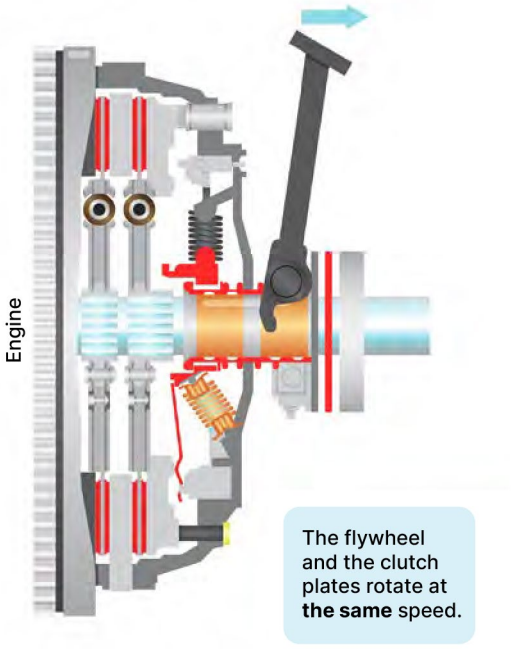
Your driving position is crucial for proper clutching. You must be seated in such a way that you can press the pedal down far enough to disengage the clutch completely, while maintaining your knee slightly bent. Keep this in mind when you adjust your seat. This topic will be discussed further in Chapter 4.

Operation

When you press on the clutch pedal, the clutch plates disengage from the flywheel to disconnect the engine from the transmission. This lets the engine rotate at different speeds from the transmission. When the vehicle is stopped, you must fully depress the clutch pedal and shift into a gear that will enable the vehicle to move.

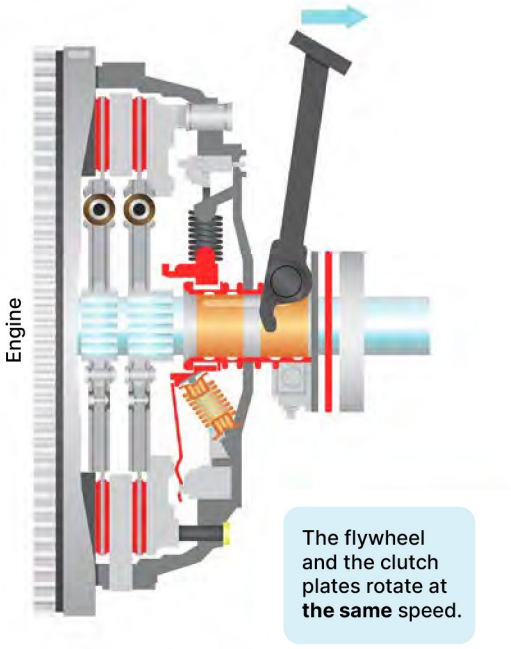
To actually set the vehicle in motion, you must then gently release pressure on the clutch pedal to reestablish contact between the clutch plates and the flywheel.

Clutch pedal released



A mechanical clutch is controlled by a steel cable or rod. A hydraulic clutch may be activated with or without pneumatic assistance.

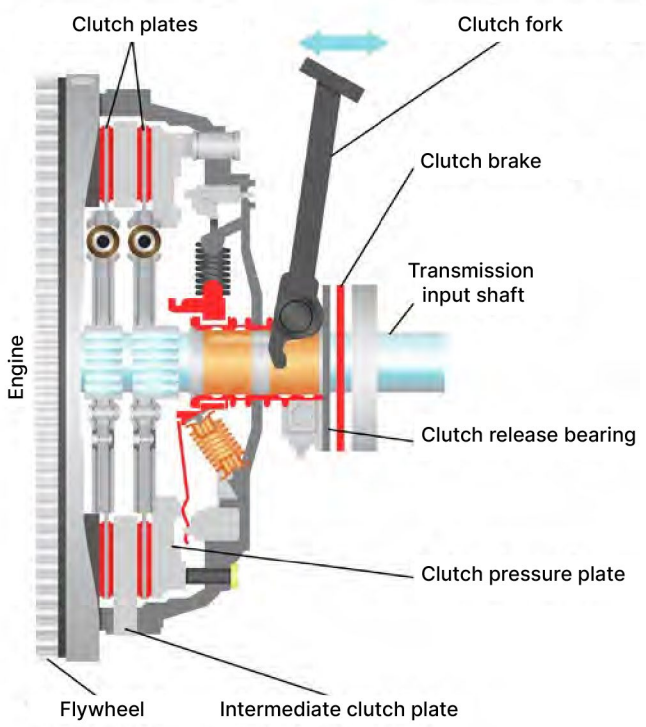
Clutch pedal released



When driving your heavy vehicle, you must avoid:

- forcing the transmission by releasing the clutch pedal too quickly;
- allowing the transmission to slip by releasing the pedal too slowly because such friction could generate excessive heat and prematurely wear out the clutch plate;
- resting your foot on the clutch pedal when not using it (this may cause unnecessary wear on the clutch);
- pressing the clutch pedal down all the way to the floorboard when shifting gears.

Clutch components



Automated manual transmissions

More and more heavy vehicles are equipped with automated manual transmissions. This type of transmission constantly monitors various engine parameters that have an impact on gear shifting, such as changes in the slope of the road and the vehicle's weight, speed and rolling resistance. Because it is a "smart" transmission, it can analyze all these factors to determine when engine parameters are just right for the smoothest transition from one gear to another.

An automated manual transmission has the same operating characteristics as a regular manual transmission. However, with an automated manual transmission, the clutch and gear selector are controlled by an electronic module.

Although this type of transmission selects the most appropriate gear, you can still select a lower gear. This may be handy while driving downhill to take advantage of engine compression. Selecting a lower gear prevents the transmission from automatically shifting to a higher gear. In certain situations, it is important to make use of this braking effect. Selecting a lower gear can also be useful when travelling through hilly terrain or on rough or slippery roads in order to prevent the vehicle from frequently shifting gears or mis-shifting gears. It is important to note, however, that when you select a lower gear you must keep an eye on the engine's RPM to prevent it from getting too high.

Automatic transmissions

Many vehicles are equipped with an automatic transmission. The transmission shifts gears based on the vehicle's travelling speed or the force of acceleration using mechanical, electronic or hydraulic controls. The shift pattern on the gear selector varies depending on the automatic transmission model.

Instead of a mechanical or hydraulic clutch, an automatic transmission uses a hydraulic torque converter to transfer the engine's power to the transmission. When the engine's RPM increases, the pressure generated by the centrifugal force and the flow of oil in the torque converter enable the vehicle to move.

This system can be compared to two fans placed face to face. By switching one of them on, the wind it produces makes the one facing it turn. The difference is that the torque converter moves oil, rather than air.

Conversely, when the engine RPM decreases, the pressure in the torque converter also decreases, and the vehicle can come to a stop without turning off the engine.

Unlike the automatic transmissions found in passenger vehicles, the automatic transmissions used in heavy vehicles do not have a "Park" position. To make sure the vehicle remains stationary when you are stopped, shift into neutral (N) while the engine is running and use the parking brake to lock the wheels.

Drive shaft

The drive shaft is used to transmit power from the transmission to the vehicle's rear drive axles. It consists of a U-joint placed at both ends that allows for changes in angles during suspension movements.

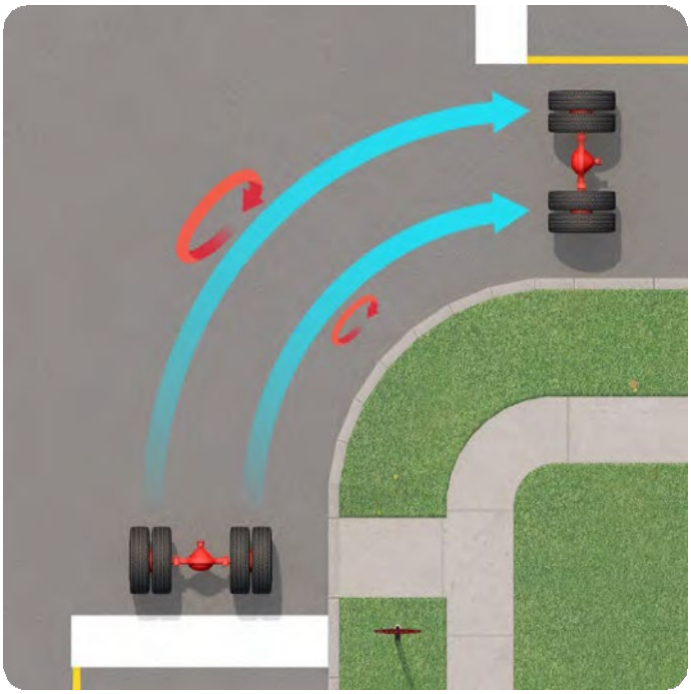
Rear drive axle (drive bridge)

Source: Spicer

Truck with single rear drive axle (single drive bridge)

Truck with dual or tandem rear drive axle (dual or tandem drive bridge)

The rear drive axle or drive axles (also called drive bridges) are used to propel the vehicle. The differential inside the drive axle transmits the longitudinal rotational energy from the drive shaft to the wheels. The differential in the rear drive axle allows the wheels on the same axle (left and right) to rotate at different speeds and maintain traction with the road surface, in particular when negotiating turns.



If a truck is equipped with dual or tandem drive axles, the front drive axle has another differential that also allows for a difference in rotation between the wheels of the front axle and those of the rear axle.

Differentials have a measurement scale called a ratio. The ratio expresses the number of drive shaft revolutions with regard to one complete rotation of the wheels. The higher the ratio (e.g., 5.38 to 1), the greater the vehicle's power when setting off and the slower its speed. Conversely, the lower the ratio (e.g., 3.08 to 1), the faster and more fuel-efficient the vehicle is at higher speeds.

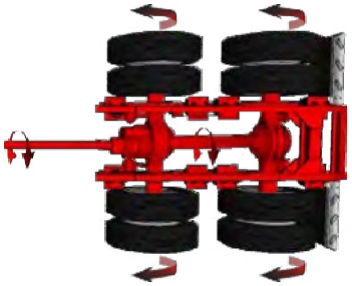
Differential lock

The inner axle differential lock mechanically locks the two wheels on the same drive axle, thereby eliminating the differential function and forcing both wheels to rotate at the same speed.

The inter-axle differential lock mechanically locks the two drive axles, thereby forcing them to turn at the same speed.

This differential locking operation is very useful when the road surface is particularly slippery when setting out. For example, without the differential lock, when one wheel is on a patch of ice, the differentials would direct the engine power to the wheel with the least amount of traction.

By locking the differential(s), the engine power is distributed evenly to all of the drive axles that are locked. The wheels that have traction can therefore propel the vehicle.



To avoid mechanical failure, the manufacturer usually limits the vehicle's speed when the differential lock is in use. As the driver, you must also exercise caution whenever the differential lock is engaged on your trip. This could cause the vehicle to understeer, which would force the vehicle to continue in a straight line in a curve or at an intersection. Be sure to follow the manufacturer's instructions regarding the use of this device.

Brake Systems

Brake systems are composed of mechanical components that are mainly activated by fluid pressure (hydraulic systems) or compressed air pressure (pneumatic systems).

Depending on the brake system, the vehicle may be equipped with:

- a service brake, which reduces the speed of the vehicle or vehicle combination using the brake pedal;
- a parking brake, which keeps the vehicle stationary when stopped;
- an emergency brake, which stops the vehicle in the event of a service brake failure or if the trailer or semi-trailer becomes unhitched from the tractor.

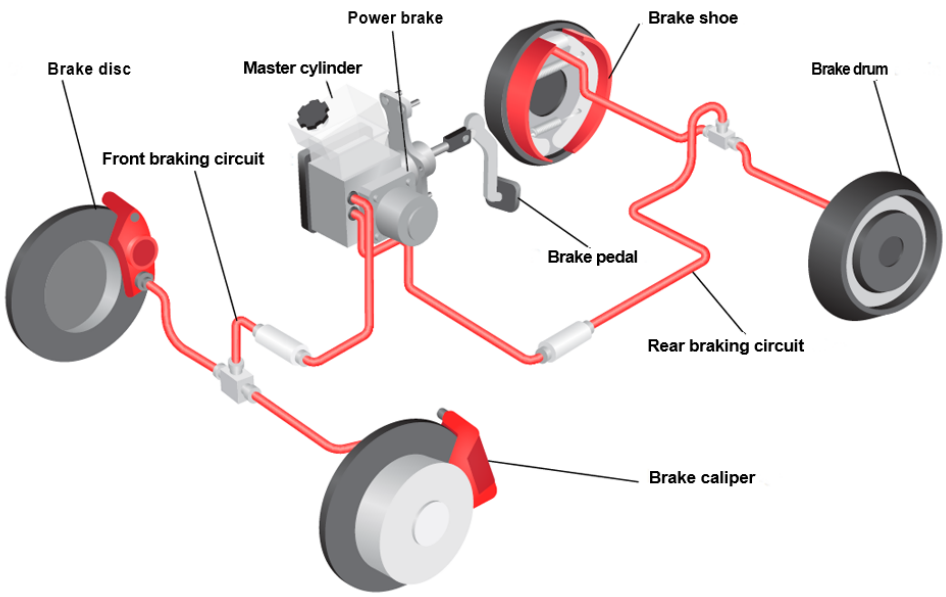
Hydraulic brake systems

Hydraulic brake systems will be covered briefly here, as several heavy vehicles are still equipped with this type of system. Chapter 5 is entirely devoted to air (pneumatic) brake systems, as most road tractors, semi-trailers, buses and straight-body trucks are equipped with such systems.

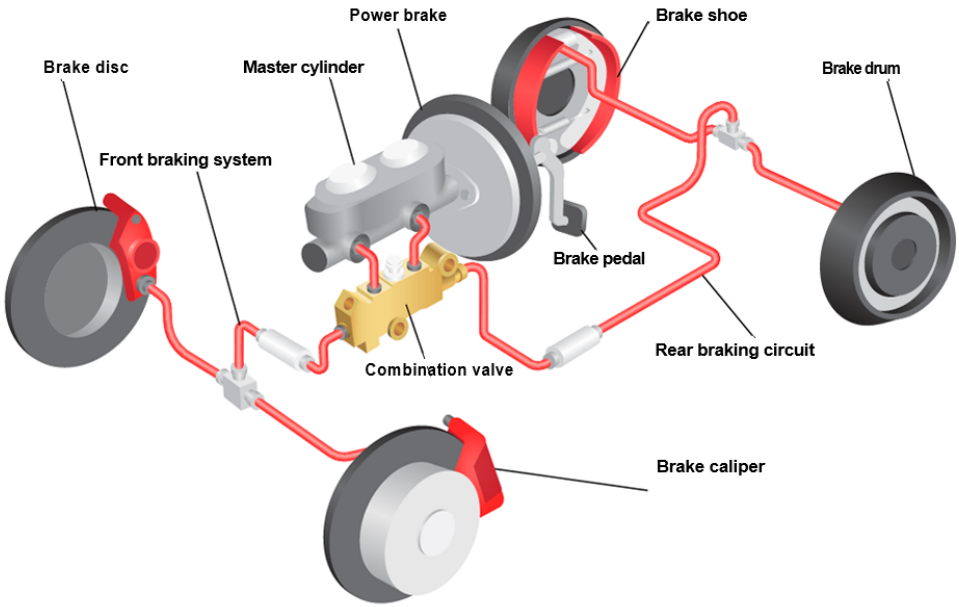
Dual braking circuits

Hydraulic service brake systems use two independent braking circuits so that if one fails, the other can still stop the vehicle. Should one circuit fail, you will need to apply greater pressure on the brake pedal, as the brakes will only be applied to certain wheels. In addition, the braking distance may be longer and repairs will be required before using the vehicle again.

Dual hydraulic brake system with electric assistance



Dual hydraulic brake system with pneumatic assistance



Brake pedal

The brake pedal is used to operate the service brake to slow down or stop your vehicle. An abnormally low brake pedal is a serious warning sign. You can slightly increase the brake pressure by quickly and repeatedly pressing down on the brake pedal (pumping the brakes). If this happens, however, you must avoid using the vehicle and have the brakes repaired without delay.

Power brakes

Power brakes make the brakes easier to use. A hydraulic or pneumatic device assists you when using the brake pedal. As a result, if your vehicle is equipped with power brakes, you do not have to press on the pedal very hard. If the engine stalls, however, you will have to press down hard on the brake pedal. You are therefore prohibited from driving the vehicle if the power brake system is not working.

Service brake indicator light

When you switch on the ignition to start the engine, an indicator light comes on to let you know the hydraulic system is working properly. If the indicator light stays on while the engine is running, this may indicate that the hydraulic brake system is defective. If this happens, it is best not to use the vehicle and have the brake system checked out.

Parking brake indicator light

An indicator light comes on when the parking brake is engaged.

How hydraulic brakes work

Hydraulic brakes, just like the air brakes you will learn about in detail in Chapter 5, use the friction created by applying the brake pads against the discs, or the brake shoes against the drums, to slow the vehicle down.

This friction generates heat, which increases more or less quickly according to the pressure applied to the brake pedal.

To maintain their effectiveness, the brakes must be in good condition and used in accordance with the capacities of the pads and discs, or shoes and drums. Excessive brake use may generate more heat than the drums or discs can absorb and dissipate. Excessive heat due to friction between pads and discs, or between shoes and drums, causes glazing (or brake glazing), which makes the pads or shoes less effective. This situation resolves itself once the pads or shoes have cooled down.

In theoretical terms, if the load you are carrying doubles the total weight of your vehicle, the stopping or braking distance is also doubled, provided the same amount of pressure is applied on the brakes. By doubling the pressure on the brakes, you can stop within the same distance, but the brakes will heat up twice as much. To alleviate overheating, you can either decrease your speed or increase the stopping distance. It is very important to never go over the vehicle's maximum authorized load: if you do, the brakes could fail completely.

The other important factor is speed. It is even more important than weight or load because the braking power required is proportionate to the square of the increase in speed. For example, when you double your speed, the braking power required is quadrupled. In other words, you have to provide four times more braking power to maintain the same braking distance. In turn, the brakes generate four times more heat. This is why you need to remain aware of the speed you are driving at.

Now that you know about the effects of weight and speed, you can imagine the power that is required from the brakes. For example, if you double the vehicle's weight and also double its speed, you will need eight times the braking power to stop the vehicle.

Supplemental brake systems

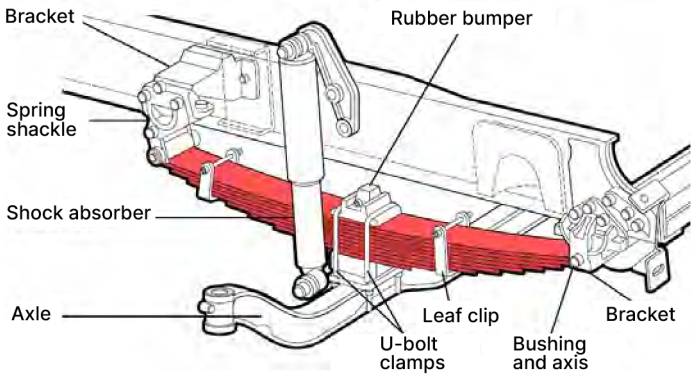
In certain situations, such as when the vehicle is loaded, supplemental brakes, also known as retarders, can make it easier to maintain the vehicle moving at the desired speed and avoid excessive use of the service brake. These systems, which are found on some heavy vehicles, use engine compression or a hydraulic or electrical device. Here are a few examples of engine brake indicators and various switches and controls, which may differ among manufacturers.

Please refer to Chapter 4 to learn about operating supplemental brakes.

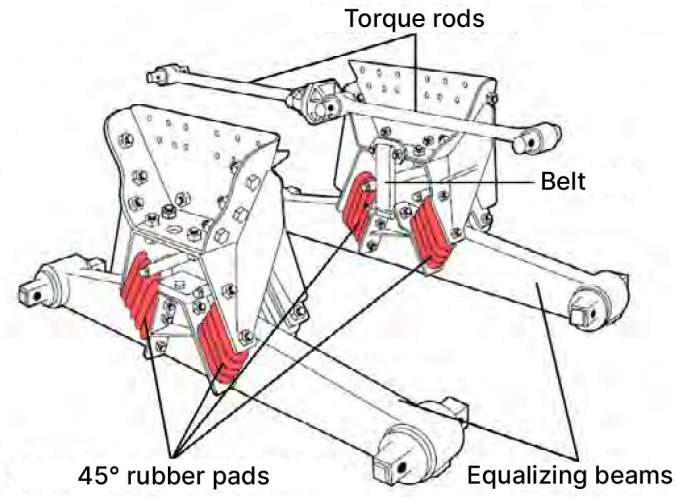
Systems Related to a Vehicle's Handling

Components such as the suspension, steering system, tires and wheels are designed for the vehicle to handle properly on the road and ensure each tire has a firm grip on the road surface. They also ensure the heavy vehicle's occupants stay comfortable and that the cargo remains in good condition.

Front spring suspension



Rubber pad suspension



Suspension systems

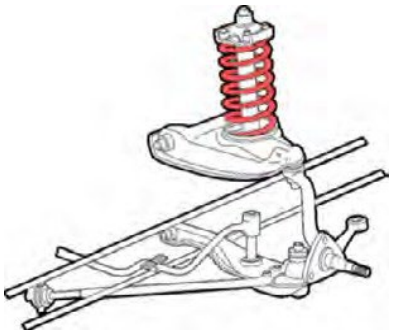
The three main types of suspension systems found on heavy vehicles are:

- metal or composite spring suspensions:
  - leaf springs,
  - coil springs,
  - torsion bar springs;
- air (pneumatic) suspensions;
- rubber pad suspensions.

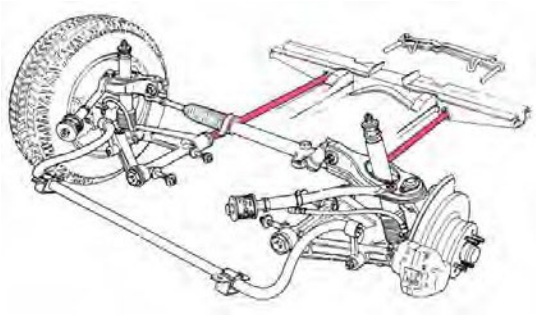
Leaf springs are usually found on the steering axle. They are also used on the rear drive axles of trucks and on the axles of trailers that operate in difficult conditions, in particular on dump trucks and waste collection trucks.

Composite leaf spring

Coil spring



Torsion bar spring

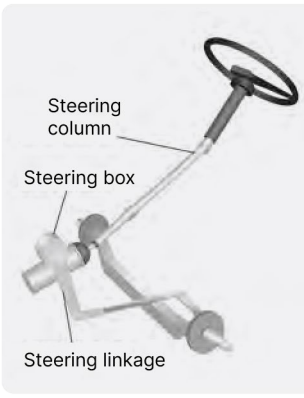


Although rarely used on the front (steering) axle, air suspension systems are usually installed on rear drive axles and trailer axles. Unlike the other types of suspension, air suspension systems adapt to the vehicle's load. This enhances the vehicle's handling and provides for a smooth ride, even when the vehicle is unloaded.

Air suspension on a drive axle

Steering system

The steering box mechanically transmits the steering wheel rotations to the vehicle's steering wheels via the steering linkage. On heavy vehicles, the steering box is usually hydraulically assisted by a power steering pump. How to inspect these components is explained in Chapter 6 on conducting circle checks.



A reservoir containing power steering fluid is pictured on the left. The fluid level must be checked on a regular basis. This is covered in Chapter 6 on conducting circle checks.

Wheels

Cast wheels with rims

Cast wheels with rims are still used on vehicles that operate in difficult conditions, such as on construction sites, landfill sites and forest roads, or that haul outsized loads. They are installed using nuts, studs, lug nuts and spacers. These types of wheels are highly resistant and feature high shock absorption qualities on bumpy roads. On the downside, they are difficult to align and are heavier than disc wheels.

Disc wheels

Disc wheels are the most widely used. They are lighter and do not require any special alignment during installation, which only requires lug nuts.

Steel disc rim

Aluminium disc rim

Tires

Tires are divided into three categories:

› Tires mounted on steering wheels are built with a wide shoulder that resists shearing during turns.

› Traction tires feature an aggressive tread pattern that grips the road surface during acceleration, regardless of road conditions.

› Trailer tires are built with a tread pattern that reduces rolling resistance and fuel costs.

Both traction and trailer tires can be mounted in either a single- or dual-tire configuration. Tires mounted in a single-tire configuration have a wider tread, which is why they are referred to as wide-band tires.

Wide-band trailer and tractor tires

Some tires can be retreaded, which involves bonding a new tread to the carcass of a tire with a worn-out tread.

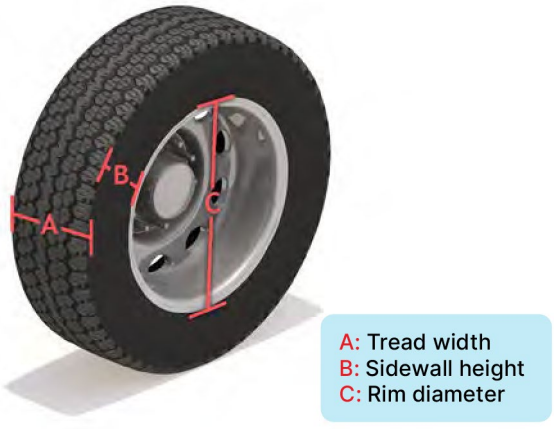
A tire's dimensions and other relevant information is indicated on the sidewall. This information includes the width of the tread in millimetres, the height of the sidewall as a percentage of the tread width, the type of carcass, and the rim diameter in inches. For example, a tire bearing the indication **455/70R22.5** means:

- a tread width of **455** mm;
- a sidewall height equivalent to **70**% of the width of the tread (455 mm X 0.7 = 318.5 mm);
- a radial carcass (**R**) as opposed to a conventional tire;
- a rim diameter of **22.5** inches.

The most widely used tire size is 11R22.5, with a tread width of 11 inches, a radial carcass, and a rim diameter of 22.5 inches.

Tires have wear indicators at the bottom of the tread grooves. How to check the tread wear is explained in Chapter 6.

A tire's load capacity and recommended air pressure are also indicated on the sidewall. The load capacity indicates the weight the tire can bear when installed in a single- or dual-tire configuration. The recommended pressure is also indicated according to whether it is installed in a single- or dual-tire configuration. Tires must be inflated when they are cold.



Axles and their load capacity

› Single axle

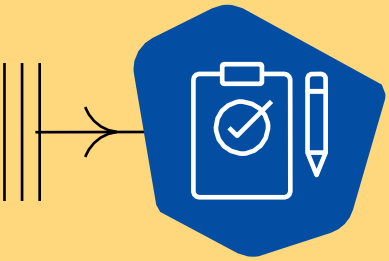
› Tandem axle

› Tridem axle

› Self-steering axle

› Lift axle

Load limits for each axle or group of axles are listed in the *Road Vehicle Load and Size Limits Guide*. Load capacity will be covered in Chapter 3.



Exercise 2.3

Check off all of the following components that you can identify on the semi-trailer truck made available to you, and then provide the information requested in the section on tires and wheels.

The power steering fluid reservoir	☐
The leafs, brackets and U-bolt clamps on the passenger side	☐
The alternator and belt	☐
The engine oil dipstick	☐
The windshield washer fluid reservoir	☐
The hydraulic clutch fluid reservoir (if so equipped)	☐
The coolant fluid reservoir and fluid colour (if visible)	☐
The steering box	☐
The air compressor	☐
The intake air cooling radiator	☐
The turbocharger turbine (caution: may be hot!)	☐
Tires and wheels:	
Front tire size:	
Front tire load capacity (single-tire configuration):	

A rag may be required to check the power steering fluid level.

Exercise 2.4

Indicate whether each of the following statements is true or false.

Statements	True	False
1. The emergency brake system is used to keep the vehicle stationary when it is stopped.	◯	◯
2. Hydraulic brakes are designed so that overheating does not affect their effectiveness.	◯	◯
3. The inter-axle differential lock control mechanically locks the two rear drive axles together, thereby forcing them to turn at the same speed.	◯	◯
4. A tire's load capacity and recommended air pressure are indicated on its sidewall.	◯	◯
5. Supplemental brakes can make it easier to keep the vehicle travelling at the desired speed and avoid excessive use of the service brake.	◯	◯

The answer key is provided at the end of this guide.

Indicators and Controls

In addition to your heavy vehicle's mechanical condition, you must be familiar with the indicators, buttons, switches and levers on the dashboard. This will ensure optimal and safe use of your heavy vehicle.

As a professional driver, you must remain vigilant and regularly check your vehicle's warning lights and indicators in order to always be aware of the state of the various systems and mechanisms. These devices provide timely notifications of any anomalies or malfunctions that could result in a dangerous situation.

Given the wide variety of dashboard configurations, make sure you can quickly locate the indicators and gauges and understand how all the switches, levers and buttons work before heading out on the road.

Although all dashboard components have their use, some are more important than others, as you will have to check or use them on a regular basis.

Controls

Air supply for the semi-trailer

Parking brake control

Hand brake for the semi-trailer

Gear selector

Exercise 2.5

Locate each indicator on the dashboard.

- Diesel fuel and exhaust fluid levels
- Coolant temperature gauge
- Odometer
- Engine oil pressure gauge
- Air pressure gauges for the primary and secondary reservoirs
- Low air pressure indicator
- Pyrometer (exhaust gas temperature indicator)
- Tachometer (rev counter)
- Voltmeter
- Speedometer

Source: Macpek

Information centre

The answer key is provided at the end of this guide.

Dashboard information centre

A Home

B Driving time systems

C Vehicle operation

D Maintenance

E Infotainment

F User settings

Warning devices and indicators

Trucks come with several types of warning devices and indicators. Many of them are similar to those found in a passenger vehicle, such as those that indicate a seat belt is unbuckled, provide the engine coolant temperature, indicate the parking brake is engaged, etc. This section only presents those that are exclusively found in trucks.

The visual presentation of certain warning devices and indicators may vary depending on the vehicle. Here are a few examples:

The exhaust system is excessively hot.

The particulate filter is clogged.

The air suspension is deflated (auditory and visual warning).

The engine brake is activated.

The thermostatic fan is activated.

The diesel exhaust fluid (DEF) level is low.

The air pressure in the brake system is low (auditory and visual warning).

.

The inter-axle differential is locked.

The front inner axle differential is locked.

The rear inner axle differential is locked.

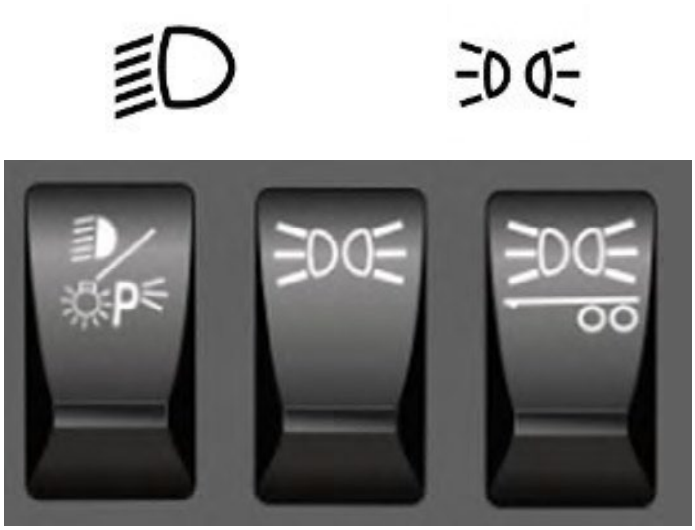
The front and rear inner axle differentials are locked.

The semi-trailer ABS anti-lock brake system is malfunctioning.

Lights and headlights

The lights and headlights play an important role in road safety. In addition to improving your ability to see at night, they let other road users better assess the position, size and direction of your vehicle during both the daytime and nighttime. Practice defensive driving by turning on your lights and headlights whenever you head out on the road.

Headlight and parking light pictograms



Mirrors

Adjusting the mirrors lets you minimize the blind spots around your vehicle. In certain cases, the vehicle's mirrors are fitted with additional convex mirrors. Mirrors are controlled manually or by an electrical device. The mirror adjustment control is located either on the driver's door or on the dashboard.

Driver's seat

The seat designed for drivers who spend long periods of time on the road usually features a number of adjustment possibilities to fit their body type. Taking the time to properly adjust your seat before setting off will reduce the potential sources of distraction while driving. These adjustments, when available, are mechanically or pneumatically controlled.

Windshield and cab windows

The windshield protects the vehicle's occupants against any projectiles that might be flying toward them: wind, rain, snow, dust, stones, birds, etc. To avoid impairing your ability to see, it is essential that it not be missing, tarnished, fogged up, cracked, tinted or obstructed by objects or stickers.

The cab's side windows let you see around the vehicle and reduce blind spots. Side windows can be controlled manually, electrically or, in very rare cases, pneumatically.

Steering wheel

The steering wheel is used to steer the vehicle while it is moving. The steering wheel of a heavy vehicle is larger than that of a passenger vehicle, which means that using it requires greater dexterity. This will be covered in greater detail in Chapter 4.

Accelerator pedal

The accelerator pedal is used to control the vehicle's speed. In order for the vehicle to move forward smoothly, you need to gradually press on the accelerator.

Optimal engine performance is achieved by properly controlling the amount of fuel being fed into it. Although fuel injection systems are equipped with increasingly effective flow control devices, the accelerator pedal plays a role in controlling the flow of fuel into the engine. You should therefore gradually press on the accelerator based on the engine's RPM. Once you have reached the desired speed, keep driving at that speed to maintain control of the vehicle. Checking the working order of the accelerator pedal will be covered in Chapter 6.

Seat belts

Seat belts keep you safely seated and prevent you from violently striking the vehicle's interior (the dashboard, the windshield, etc.) in the event of a collision. Checking the condition and working order of the seat belts will be covered in Chapter 6.

Windshield wipers and washer fluid

Depending on the vehicle's manufacturer, the windshield wiper and washer fluid controls may be located on the turn-signal control arm, on a control arm on the right side of the steering wheel, or on the dashboard. Most heavy vehicles have electric wiper and washer controls, although some trucks still have pneumatic controls.

Heater and defroster

The heating system provides comfort to the vehicle's occupants. It also features a windshield defrosting option. This system helps you maintain an optimal view of the road, road signs, traffic signals and pavement markings. The defroster is one of the components included in the circle check and will be covered in Chapter 6.

Emergency material

- Emergency material includes three triangle reflectors, three flares or three lamps.
- The use of flares is prohibited in vehicles used to transport flammable or explosive materials.
- Under the *Regulation respecting road vehicles used for the transportation of school children*, vehicles used for this purpose must be equipped with at least three triangle reflectors in good condition.
- Under the *Regulation respecting road vehicles used for the transportation of school children*, vehicles used for this purpose must also be equipped with a first-aid kit. Even though it is not mandatory, a first aid kit is also found in most other heavy vehicles.
- A chemical fire extinguisher is mandatory equipment for school buses and trucks transporting certain dangerous substances. However, most heavy vehicles have a fire extinguisher. You should periodically check the pressure gauge to make sure it is ready to be used if a fire breaks out.

Driver Assistance Systems

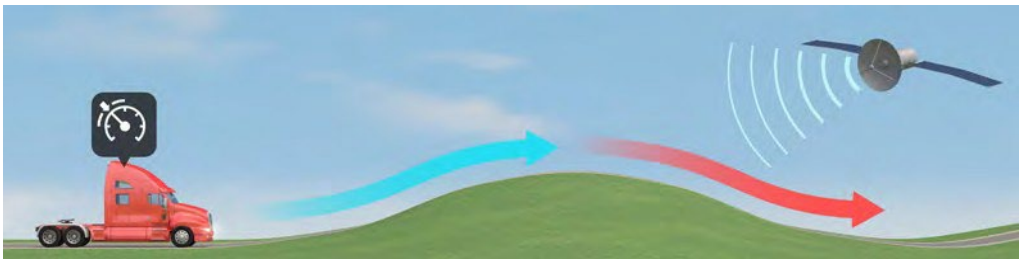
Certain heavy vehicles are equipped with driver assistance systems. These systems are designed to help you carry out certain manoeuvres and may intervene under certain conditions. They are represented by a pictogram on the dashboard. Their applications vary depending on the driver assistance system and the vehicle's manufacturer. Such systems are not automatically installed in all vehicles. Several types are offered as optional equipment. To find out more about their availability and operation, refer to the vehicle's owner's manual.

Here are some examples:

› **Adaptive cruise controls** are advanced speed control devices that let you maintain a predetermined distance between your vehicle and the vehicle ahead. A sensor installed at the front of the vehicle measures the distance and relative speed of the vehicle ahead. The way adaptive cruise controls function is illustrated below:

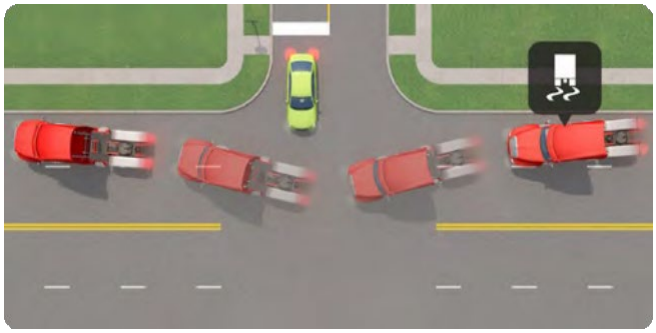
1) The system adjusts the vehicle's speed to maintain the selected cruising speed and the minimum predetermined distance from the vehicle ahead.
2) If the system detects that the vehicle ahead is quickly slowing down or that a vehicle from another lane is cutting you off, the system automatically applies limited braking and may alert you with a warning light or audible signal.
3) Once the lane has become clear again, the system automatically accelerates the vehicle to resume the previously set cruising speed.

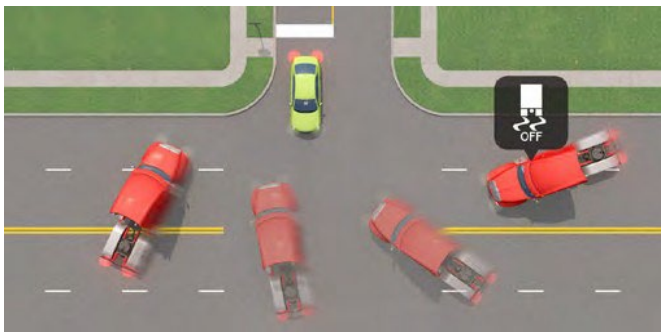
› **Predictive cruise controls** can increase or decrease the vehicle's speed when it is approaching a steep slope. Predictive cruise control devices are based on Global Positioning System (GPS) technology. Detailed information from road maps is used to determine the driving conditions the vehicle will encounter. When the system anticipates imminent slope variations, it can deactivate the set cruise control speed, change the gear shifting strategy in the transmission or modify engine parameters in order to save fuel.



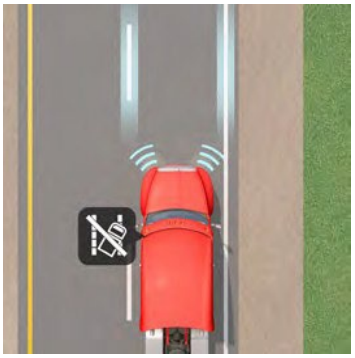
› **Anti-lock braking systems (ABS)** prevent the wheels from locking up by modulating the pressure applied to the brakes. This helps you maintain control of the vehicle's trajectory during a braking manoeuvre.

› **Electronic stability control systems** help you maintain control of the vehicle, particularly when steering or braking suddenly to avoid an obstacle or when on a slippery road surface. This system works with the anti-lock braking computer and uses the same sensors and modulating valves. It can also adjust the engine torque and apply the service brake, and sometimes even the supplemental brake. Other sensors are added to send information to the electronic control module, such as information on the steering wheel angle and the vehicle's lateral movement.

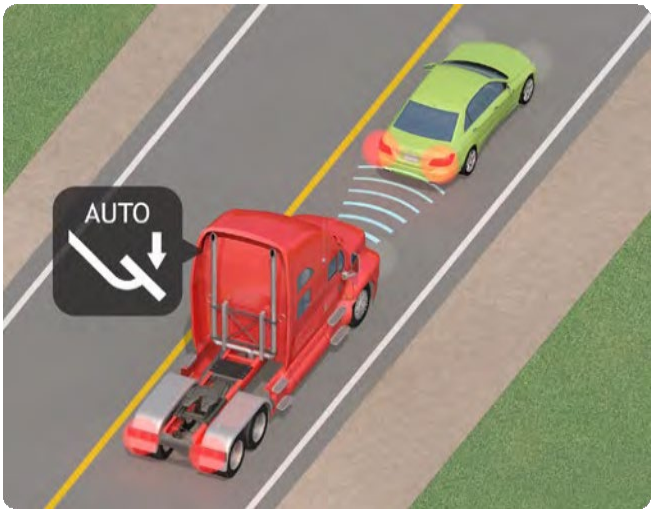




› **Lane-keeping systems** help correct the vehicle's trajectory. Most of these systems use a forward-facing camera that can detect pavement markings ahead of the vehicle. The lane-keeping system applies a brief corrective action (steering or braking) or can provide additional steering force and an audible signal if the vehicle starts to drift out of its lane without the turn signal having been activated. Some systems can also help keep the vehicle in the middle of its lane.



› **Automatic emergency brake systems** use technology that monitors a moving vehicle's environment and automatically applies the brakes when it detects an imminent collision. Reducing the vehicle's speed before the collision helps decrease the severity of the impact and, in some cases, avoid the collision altogether. Some systems can also detect the presence of a pedestrian, a cyclist or other obstacles and intervene to avoid a collision. Automatic emergency brake systems are not mandatory equipment on new vehicles sold in Canada, but some manufacturers offer such systems as standard or optional equipment on certain models.

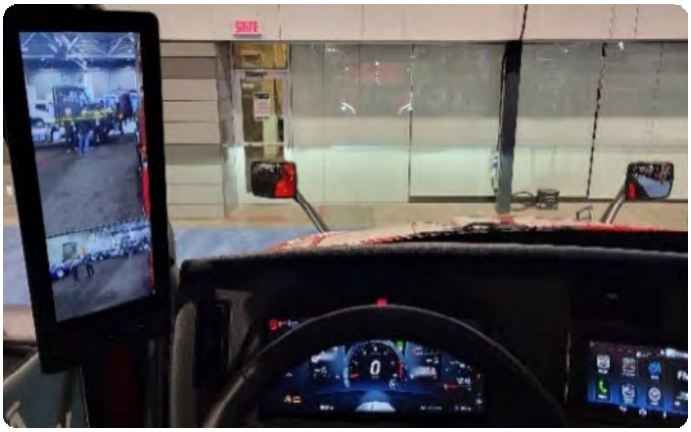


› **Electronic mirrors** use external cameras mounted on the mirrors (which are smaller in size) that transmit the signals to interior screens. These screens are comparable in size to conventional mirrors and can display regular or wide-angle images.

These types of mirror systems greatly improve your ability to see by providing a clearer and wider view around the truck, both day and night and in bad weather. High-definition interior screens place the rear-view image in a position that lets you keep your eyes on the road. In addition, they are positioned along the cab's A-pillar, which reduces the blind spots that are usually produced by large exterior side mirrors. In compliance with regulatory requirements, vehicles continue to be equipped with small exterior mirrors for the time being. Depending on the manufacturer, this technological innovation also lets you keep an eye on your trailer in a curve or while backing up.

Here are the main advantages of electronic mirrors:

- They significantly reduce or even eliminate blind spots on the ground and near the cab.
- They provide a wider field of vision.
- They automatically adjust the brightness of the screen.
- They improve night vision.
- They eliminate glare, particularly from the sun.
- Their cameras are water repellant (do not retain water).
- They improve your ability to see in cold weather and icy conditions.
- You can actively track the trailer's movement in curves and while backing up.
- Adjustments are easier to make.
- The back of the trailer's position is identified and indicated on the screen.
- Fuel consumption is reduced.

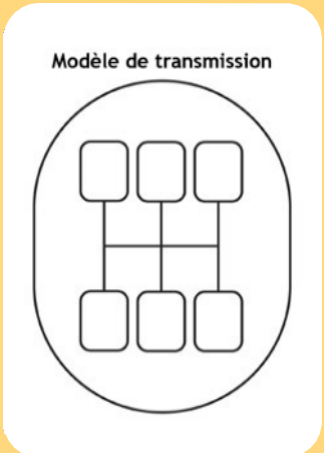


Exercise 2.6

In the cab of the vehicle made available to you, locate and identify the following components:

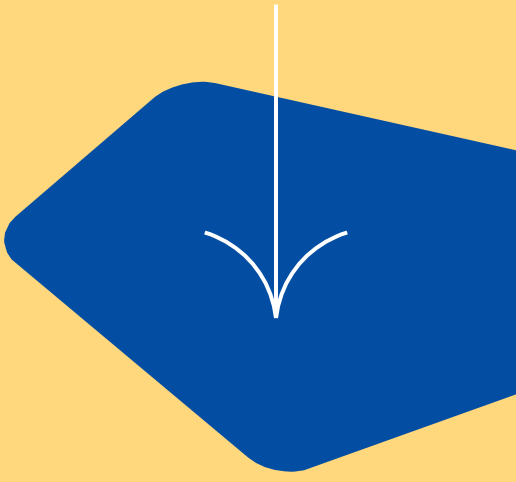
The mirror controls	☐
The seat adjustment controls	☐
The headlight and light switches	☐
The hazard light switch	☐
The heating and defrosting controls	☐
The stability control system switch (if so equipped)	☐
The cruise control switch	☐
The lane-keeping system activation control (if so equipped)	☐
The emergency material	☐
The retarder switch (if so equipped)	☐
The windshield wiper and washer fluid controls	☐
The steering wheel adjustment device	☐
The inter-axle and inner axle differential lock controls (if so equipped)	☐
The tractor suspension controls	☐
The primary and secondary air pressure gauges	☐

Reproduce here the gear shift pattern of the vehicle made available to you. If that vehicle does not have a manual transmission, check out a vehicle that does. If you do not have access to a vehicle with a manual transmission, search online for a shift pattern you can copy out here.



Chapter 3

3 Laws and Regulations



Road safety is generally regarded as being in large part the driver's responsibility. Accidents are more often caused by a driver's behaviour than by the vehicle, the road or any other factor.

You must therefore do everything you can to avoid accidents. For starters, it is important to be very familiar with and obey the laws and regulations that govern road transportation. You must also adopt safe and defensive driving techniques while at the wheel of a heavy vehicle. This means adapting your driving to the type of vehicle you are driving, the type of goods you are transporting—or the fact that you are carrying passengers—and traffic.

Understanding your rights, meeting your obligations and respecting the rights of other road users will set you on track to becoming a truly professional driver!

Driving a Heavy Vehicle

Rules

Heavy vehicle drivers are required to obey many laws and regulations. Under the *Highway Safety Code*, for instance, they must make sure their vehicle undergoes an inspection each day and at predetermined intervals. This is what is known as a circle check.

The *Regulation respecting hours of driving and rest of heavy vehicle drivers* was adopted to cut down on the risk of accidents involving heavy vehicle drivers. These regulatory provisions also affect operators, since they must ensure that the drivers they employ are able to drive safely.

If you are going to be driving outside Québec, make sure that you are familiar with the laws and regulations in force in the states, provinces or territories where you will be travelling. Heavy vehicle drivers in the United States, for instance, must be at least 21 years of age. In some jurisdictions, the hours of driving and rest, as well as the classification of major and minor defects, may be different.

School bus drivers also must receive safety training and hold a certificate of competency proving they have received such training.

Various safety standards apply to road transportation and the resulting responsibilities fall not only to the owner and operator, but also to the driver.

Note that the *Act respecting owners, operators and drivers of heavy vehicles* also applies to certain vehicles that are defined as “heavy vehicles” by the Act but do not require a Class 1, 2 or 3 driver’s licence.

Drivers of the following vehicles are subject to these same obligations regardless of the class of driver's licence they hold:

- equipment transport vehicles with a GVWR of 4,500 kg or more;
- emergency vehicles with a GVWR of 4,500 kg or more;
- combinations of road vehicles including at least one vehicle with a GVWR of 4,500 kg or more;
- tow trucks (regardless of GVWR) ;
- buses (regardless of GVWR) ;
- vehicles carrying dangerous substances that require the display of safety mark placards (regardless of GVWR).

The rules heavy vehicle drivers must follow are summarized in the following list, which is arranged by subject matter. They are explained in depth later on in this chapter.

Circle check

- Perform a sound and sight inspection of your vehicle's condition and record your observations (major and minor defects) in the circle check report.
- Keep the circle check report up to date.
- Keep the circle check report in your vehicle.
- Report any mechanical defects and anomalies in writing.
- Do not drive the vehicle if it has a major defect.

Transportation of passengers and goods

- Comply with the legal passenger limit.
- Arrange and secure baggage, cargo and mail properly in a bus's designated storage compartments.
- Properly secure the load on a truck.
- Obey the regulations governing the transport of dangerous substances, including the prohibition on driving through tunnels.

Driver's licence

- Inform the operator if your licence or the licence class and endorsements authorizing you to drive the vehicle is modified, revoked or suspended.
- Comply with the requirements of any peace officer who suspends your licence or your right to drive certain vehicle classes because you have exceeded the number of driving or on-duty hours prescribed by regulation, or were driving without a valid licence or while impaired (drugs, alcohol or fatigue).
- Hold only one driver's licence of the class and with the endorsements required for driving the vehicle in question. Refer to the "Driver's Licence" section in Chapter 1 of this guide for more information.

Driving and off-duty hours

- Unless you have been exempted from doing so, keep an accurate 14-day record of duty status in your vehicle, regardless of the cycle you are following.

Vehicle registration

- Have the vehicle's registration certificate and proof of insurance coverage in your possession.

Vehicle and equipment

- Buckle up and do not drive if the seat belt is missing, has been altered or is not in working order.
- Use a flashing or rotating yellow light, as needed, in accordance with the conditions of your special travel permit.
- Put a red flag or reflective panel and, at night, a visible red light on the rear end of an outsized load if it extends more than one metre beyond the rear of the vehicle.
- Keep safety equipment (emergency warning triangle and reflectors, flares or lamps) on board the vehicle.

Bills of lading[14]

A *bill of lading* is a document that states the terms of a transport contract. According to the *Civil Code of Québec*, a transport contract (contract of carriage) is a contract by which the carrier undertakes to carry a person or property from one place to another in return for a price, which another person undertakes to pay.

In addition, the *Regulation respecting the requirements for bills of lading* prescribes minimum requirements for transport contracts. These requirements limit carrier liability in the case of loss of or damage to the goods comprising the shipment, despite the fact that the carrier has an obligation of result.

The bill of lading gives truck drivers the following basic information:

- loading address;
- delivery address;
- particulars of the goods comprising the shipment;
- delivery details (scheduled time, emergency contact, etc.).

The bill of lading is among the documents that drivers must have in their possession during their entire trip. Once the delivery is made, the bill of lading must be given to the carrier for payment.

Vehicle size and load

- Have in your possession a special travel permit for an outsized or overloaded vehicle.
- Comply with the conditions of the special travel permit.

Roadside inspections and facility audits

- Obey instructions from peace officers (police or carrier enforcement officers) and respect their work.

14 Ministère des Transports et de la Mobilité durable

In the event of an accident

If you are involved in an accident, you have certain responsibilities under the *Highway Safety Code*. First of all, you must remain at the scene of the accident or return to it immediately. If anyone is injured, you must help the victim in any way you can and contact the police. You must also provide any information required by the police officer who comes to the scene.

Since you spend a lot of time on the road, at some point you may be the first person to arrive at the scene of an accident.

If you witness an accident or are the first person to arrive at the scene, you can be of help. Pull over and leave your vehicle about 30 m from the scene and turn on your hazard lights.

Contact the police immediately or have someone else do so as soon as possible. If anyone is injured, turn off the ignition of the vehicle involved as a safety precaution. If possible, set out flares or reflectors to warn other road users.

Try to assist anyone who has been injured as best you know how. A first-aid training course is a good way of acquiring practical knowledge for such situations. It is also a good idea to keep a first-aid kit in your vehicle at all times.

On arriving at the scene of an accident and for as long as you remain there, make sure you can provide assistance without endangering yourself or others.

Move-Over Law

Because of their size, heavy vehicles represent a particular danger for anyone working alongside the road.

This is why you must obey the Move-Over Law that requires you to respect a buffer zone around an emergency vehicle (police vehicle, ambulance, fire department vehicle or Contrôle routier Québec vehicle), a tow truck or other type of vehicle when it is stopped on the side of the road with its yellow arrow light signal, rotating lights or flashing lights activated.

Slow down and change lanes to move over as far as possible from the stopped vehicle, after you have made sure that you can do so safely. If circumstances so require, stop your vehicle.

To learn more, visit move-over-law.gouv.qc.ca.

In the presence of a road work zone

As a heavy vehicle driver, you must pay attention to the signs installed near and in road work zones. Observe the speed limit indicated on the orange sign, as you would the speed limit on a white road sign.

Look far ahead to check whether there are any changes in traffic or if a part of the road is blocked. Due to road work, a part of the highway might also have to accommodate two-way traffic over several kilometres. Do not brake suddenly if you need to change lanes.

In the presence of a flagperson

A flagperson directs traffic on a road where construction or maintenance work is being carried out. A flagperson uses an eight-sided sign with “Arrêt” (Stop) on one side and “Lentement” (Slow) on the other.

“Arrêt” sign

You must stop and wait for the flagperson to signal you to proceed.

“Lentement” sign

You must slow down and proceed with caution. You must also maintain an adequate distance from the flagperson and not endanger any person or vehicle on the site.

See the section entitled “Roadwork signs” in the *Driver’s Handbook*.

Habits you must develop

Seat belts

In Québec, heavy vehicle drivers must wear the seat belts installed by the vehicle manufacturer. Statistics prove that this greatly reduces the number of deaths and the severity of injuries caused by traffic accidents.

Whether an accident involves one or more vehicles, seat belts protect their occupants by keeping them in their seats. This prevents the driver from hitting the steering wheel or windshield and from being thrown from their vehicle.

Electronic devices and driving

Holding any kind of portable electronic device in your hand while driving is illegal, regardless of how you are using it. This restriction does not apply, however, to the driver of an emergency vehicle when on duty.

The law applies to all devices, whether or not they are in use, such as:

- cell phones (including those with a transmitter-receiver function);
- MP3 players or portable multimedia players;
- portable satellite radios;
- electronic tablets;
- screens that display information that is not relevant to driving the vehicle or the operation of its usual equipment;
- devices that display emails and allow the user to browse the Internet.

Screens and driving

Global Positioning System (GPS) devices have become more and more popular in recent years. While very useful for directions, it remains a potential source of distraction for the driver. It must therefore be used with discernment. If you need to program the system or enter information, do so before leaving. The same applies when using an electronic log book, which must only be used when the vehicle is parked in a safe location.

The meaning of the expression “while driving”

A driver who brings their vehicle to a stop to comply with signage or due to traffic is still considered to be driving. The individual is considered to be controlling the vehicle while obeying road signs and traffic signals or while waiting for traffic to resume. A driver who is waiting at a red light or in a traffic jam is considered to be driving their vehicle and therefore cannot use a hand-held electronic device.

A driver who brings a vehicle to a safe and legal stop by the side of a road in order to use a portable electronic device is no longer considered to be driving, even if the vehicle’s engine is still running.

CBs are authorized

This restriction does not apply to devices installed in the vehicle in such a way that only the microphone or receiver is held in the hand. This exemption covers shortwave two-way radios that do not allow both parties to talk simultaneously, more commonly known as CBs or walkie-talkies.

Removal of snow and ice buildup

You must remove accumulated snow and ice from your vehicle before you get on the road. Snow that is blowing off a heavy vehicle can considerably reduce visibility for drivers following behind. In addition, chunks of hardened snow and ice that come loose when the vehicle is in motion can injure pedestrians, damage cars and even cause accidents. You are liable to a fine if you drive a vehicle covered with snow, ice or any other matter that may detach from the vehicle and constitute a hazard for other road users.

Find out how your operator removes snow and ice buildup from the roof and other areas of the vehicle. Snow removal methods may include:

- automated snow removal system;
- ramp and scaffold;
- roof snow removal service.

In all cases, be careful during snow removal operations.

Sources: Via Prévention and Centre de formation du transport routier

The *Regulation respecting environmental standards for heavy vehicles*

All heavy vehicle owners are required to take the necessary steps to ensure that their vehicles meet the environmental standards for heavy vehicle emissions and pollution control devices and systems prescribed by the *Regulation respecting environmental standards for heavy vehicles*.

These standards are designed to:

- reduce the harmful emissions produced by this mode of transportation and, as a result, improve air quality and generate a positive effect on health;
- ensure that heavy vehicles are better maintained;
- enable owners to save on fuel.

These standards apply to the following types of vehicles travelling on public roads, regardless of the type of fuel used:

- road vehicles and combinations of road vehicles, within the meaning of the *Highway Safety Code*, with a gross vehicle weight rating (GVWR) of 4,500 kg or more, except for farm tractors within the meaning of section 2 of the *Regulation respecting the registration of road vehicles* and tool vehicles within the meaning of the *Highway Safety Code*;
- buses, minibuses and tow trucks within the meaning of the *Highway Safety Code*.

Heavy vehicles that are used in a competition, show or race on a track or other location that is closed to all other automobile traffic are **exempt** from these standards.

Emission control devices and systems

All heavy vehicles subject to the Regulation must be equipped with a properly functioning pollution control device or system that reduces the emission of hydrocarbons, carbon monoxide, nitrogen oxide or particles in the atmosphere.

These standards apply to all heavy vehicles that are operated, sold, leased or placed at the disposal of an individual for valuable consideration in the part of Québec covered by the Regulation, that is, all of Québec except for regions located north of the 55th parallel. These standards therefore apply to the majority of roads connected to the province's road network.

Heavy vehicle owners may not allow a pollution control device or system installed on any of their vehicles to be removed or modified, except to replace it if it is defective.

The replacement pollution control device or system must be equivalent to the device or system used as a replacement unit by the vehicle manufacturer. The identification code of the manufacturer of the replacement system or device must be indicated on the device or system.

Roadside emissions testing

The environmental standards for heavy vehicles prescribed by the Regulation may be enforced by means of roadside emissions testing. These tests are done by carrier enforcement officers on public roads.

Carrier enforcement officers are thus authorized to measure emissions generated by a heavy vehicle if visible exhaust fumes or the odour of the exhaust fumes gives reasonable cause to believe that the vehicle does not meet the requirements of the *Regulation respecting environmental standards for heavy vehicles*.

If the emission levels measured exceed authorized standards, the carrier enforcement officer issues an offence report.

The owner of a vehicle that does not comply with environmental standards will be served a statement of offence by the Ministère de la Justice and a notice by the Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs requiring the owner to repair the vehicle or have it repaired. The owner must also obtain an attestation of compliance from an accredited repair establishment within 30 days of receiving a repair notice. If the vehicle is used after the 30-day period without the owner having obtained such an attestation, the owner is liable to a fine double the amount of the initial fine. The owner is also prohibited from selling a non-compliant vehicle from the time the vehicle is intercepted by carrier enforcement officers until the time the attestation of compliance is issued.

For more information on the Programme d'inspection et d'entretien des véhicules automobiles lourds (PIEVAL), visit www.environnement.gouv.qc.ca/air/pieval (in French only).

Contrôle routier Québec

Contrôle routier Québec (CRQ) is responsible for ensuring that vehicles carrying passengers or goods throughout Québec comply with the applicable regulations. The CRQ plays an essential role in ensuring road safety, protecting infrastructures and guaranteeing fair competition.

In 2023, Contrôle routier Québec had:

- 60 inspection stations;
- 450 employees, including:
  - approximately 300 carrier enforcement officers,
  - approximately 20 agents at its Centre de communication opérationnelle;
- 180 patrol vehicles;
- 1 mobile unit;
- 1 road safety unit;
- 21 regional offices.

To fulfill its mandate, Contrôle routier Québec, among its other responsibilities, enforces 9 laws and 32 regulations that heavy vehicle owners, operators and drivers must obey, such as the *Highway Safety Code*, the *Transport Act* and the *Act respecting owners, operators and drivers of heavy vehicles*.

CRQ inspections and interventions are conducted in accordance with standards established by the Commercial Vehicle Safety Alliance (CVSA). Québec is committed, along with other Canadian jurisdictions, the United States and Mexico, to harmonizing mechanical inspection standards across North America.

As a heavy vehicle driver, you may be subject to a roadside inspection by a carrier enforcement officer. In such a case, you are required to stop your vehicle and cooperate with the peace officer. An inspection may cover the following points:

- driver's licences;
- vehicle registration;
- registration in the register of owners and operators of heavy vehicles;
- transport permits;
- bills of lading (on the goods carried and the trip) ;
- leasing contracts;
- hours of driving and on-duty and off-duty time;
- circle checks;
- mechanical condition;
- vehicle weight and size;
- registration with Revenu Québec (International Fuel Tax Agreement or IFTA);
- load securement;
- transportation of dangerous substances;
- compliance with traffic rules and regulations;
- environmental standards for heavy vehicles.

In addition to enforcing the regulations governing the passenger and freight transportation industry across Québec, CRQ conducts road safety awareness activities and operations with the public and its partners, including:

- a joint operation with the Sûreté du Québec and police trainees;
- Operation Dégivreur (snowstorm patrol)
- Operation Blizzard (illegal contraband shipments);
- a student transportation operation;
- awareness activities on heavy vehicle blind spots.

The *Act respecting owners, operators and drivers of heavy vehicles*

The *Act respecting owners, operators and drivers of heavy vehicles* aims to increase the safety of road users on roads open to public vehicular traffic and preserve the integrity of those roads. For this purpose, the Act prescribes procedures for identifying heavy vehicle owners, operators and drivers that appear to exhibit unsafe conduct. The Act also sets up a system of safety ratings applicable to highway transport businesses that haul goods and carry passengers.

All the other Canadian provinces and territories have similar systems for monitoring heavy vehicle driver conduct. Such systems help to harmonize regulations concerning heavy vehicle operation throughout Canada.

The driver's responsibilities

The responsibilities of heavy vehicle drivers are determined by the laws and regulations of the government and municipalities of Québec regarding road safety and protecting the integrity of the road network. Heavy vehicle drivers must therefore ensure they hold a valid driver's licence of the appropriate class for the heavy vehicle they drive, as well as any required endorsements, and that they abide by any licence conditions.

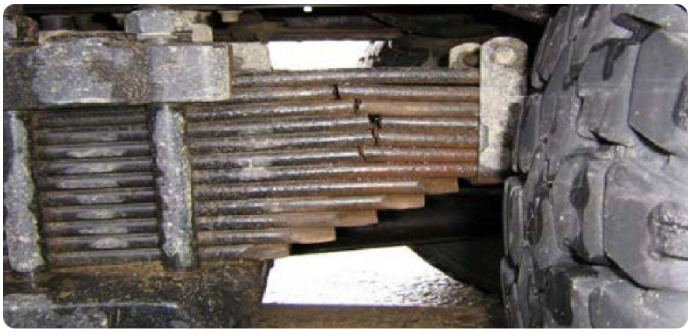
They must comply with:

- traffic rules and the general requirements set forth in the *Highway Safety Code* (HSC);
- the provisions of the HSC and the *Regulation respecting safety standards for road vehicles* with regard to the circle check;
- the provisions of the *Regulation respecting the hours of driving and rest of heavy vehicle drivers*;
- the requirements for driving a heavy vehicle transporting dangerous substances; and
- the provisions of the *Criminal Code*.

Responsibilities of owners

Owners must comply with their obligations to maintain their heavy vehicles and ensure that they are in good mechanical condition. Pursuant to the *Regulation respecting safety standards for road vehicles*, this includes:

- complying with the requirements respecting mandatory mechanical maintenance;
- repairing mechanical defects detected during roadside inspections or during mechanical inspections performed by a road vehicle inspection agent at the request of a peace officer; and
- repairing mechanical defects detected during a circle check or an inspection specific to motor coaches.



Responsibilities of operators

Operators must ensure that the drivers they hire:

- hold a valid driver's licence of the appropriate class for the heavy vehicle they drive;
- have the necessary endorsements for the heavy vehicle they drive and comply with any conditions that appear on their driver's licence;
- comply with traffic rules and the general requirements of the *Highway Safety Code*;
- comply with the provisions of the *Regulation respecting the hours of driving and rest of heavy vehicle drivers*;
- comply, where applicable, with the requirements for driving a heavy vehicle transporting dangerous substances and in particular the requirements for appropriate training, holding a valid training certificate, and the prohibition on travelling in tunnels; and
- comply with the provisions of the *Criminal Code*.

Operators must also comply with the following regulations and ensure that the drivers who work for them do so as well:

- the *Regulation respecting safety standards for road vehicles* (in particular, the rules regarding the circle check and the inspection specific to motor coaches);
- the *Cargo Securement Standards Regulation*;
- the *Vehicle Load and Size Limits Regulation*;
- the Transportation of Dangerous Substances Regulation; and
- the *Regulation respecting special permits* (with regard wto outsized vehicles).

Operators are liable for "at-fault accidents" involving heavy vehicles they operate.

Registration in the register of owners and operators of heavy vehicles (Registre des propriétaires et des exploitants de véhicules lourds)

Heavy vehicle drivers who also own or operate heavy vehicles must be registered in the Commission des transports du Québec's register of owners and operators of heavy vehicles. Under the *Act respecting owners, operators and drivers of heavy vehicles*, owners and operators must be registered in order to be authorized to put a heavy vehicle into operation or operate a heavy vehicle.

Heavy vehicle signage

Signage plays an important role in road safety. This is especially true for heavy vehicle drivers, considering the size and weight of their vehicles. Throughout this chapter, you will see road signs in connection with different topics. But beforehand, we suggest that you test what you know about heavy vehicle signage.

For more information on signage, refer to the *Driver's Handbook* and the list of traffic control devices used on Québec roads available on the Ministère des Transports et de la Mobilité durable website (www.rsr.transports.gouv.qc.ca).

Transportation of Goods

This section provides general information about the following topics that apply to the carrier industry:

- vehicle load and size limits;
- principal cargo securement standards;
- transportation of dangerous substances.

In addition to delivering your load without incident, you must also obey the road safety rules and statutory requirements that govern the transportation of goods.

Depending on the transportation category and sector, you may sometimes have to load and unload the goods you are carrying. In such cases, you are responsible for making sure your load is evenly distributed and properly secured.

You must also adjust your driving to the type of vehicle you are using and the type of cargo you are carrying. For example, driving a tank truck with liquid cargo that moves around is quite different from carrying stationary cargo such as lumber. You must take into account the weight of the load you are carrying, the load's centre of gravity and the length of the load, which sometimes exceeds the length of the vehicle.

By exercising caution and employing the suggested steps and techniques, you will learn to adjust your driving based on all these factors and develop the skills and habits of a real professional.

Load restrictions

Protecting the road network

Every year, all sorts of vehicles carrying all sorts of loads use the road network. Since the cost of repairing and improving Québec roads can run into the millions of dollars, the need for rules and regulations restricting vehicle loads is obvious.

Exceeding the load limits prescribed by regulation or by the manufacturer can also cause serious damage to key vehicle components, such as the brakes, tires, suspension and coupling device. These components are designed to support a specific maximum load. Exceeding that limit will cause them to wear out prematurely.

Vehicle load and size limits

The main purpose of the *Vehicle Load and Size Limits Regulation* is to ensure the safety of road users and protect infrastructure such as roadways and bridges. The Regulation

sets standards limiting load size, load per axle class and the total loaded mass of heavy vehicles travelling on public roads, based on the axle classes defined in the Regulation.

The methods for determining authorized heavy vehicle load and size limits are described below. For complete information, refer to the Regulation or consult the *Vehicle Load and Size Limits Guide* available from the Ministère des Transports et de la Mobilité durable.

Load limit per axle class

The maximum load authorized for an axle class is the lowest of the following three values:

- the total capacity of all tires in the same axle class—the manufacturer indicates this capacity on the sidewall of the tire;
- the front-axle capacity:
  - 5,500 kg for a front single axle (class B.1),
  - 11,000 kg for a front tandem axle (class B.2) or front multiple axle (class B.3),

  Note that the front-axle capacity may be greater where indicated by the vehicle manufacturer or by a vehicle modifier that has made alterations to a vehicle with the authorization of the Société de l'assurance automobile du Québec (SAAQ);
- the load limit of the axle class, depending on the time of year (normal period or spring thaw).

Total loaded mass

The authorized total loaded mass for a truck or vehicle combination is the lower of the following two values:

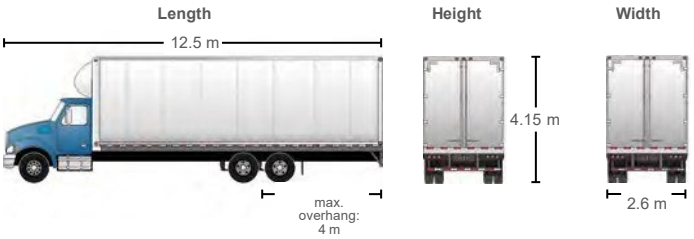
- the sum of the maximum loads authorized for each axle class, depending on the time of year (normal period or spring thaw);
- the total loaded mass limit for the category of vehicle to which it belongs.

Dimensions

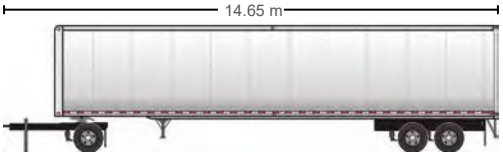
In general, the authorized maximum dimensions for each category of vehicle, including the load, are as follows:

Length, width and height

Trucks

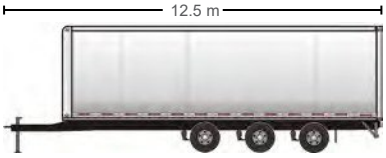


Trailer with dolly

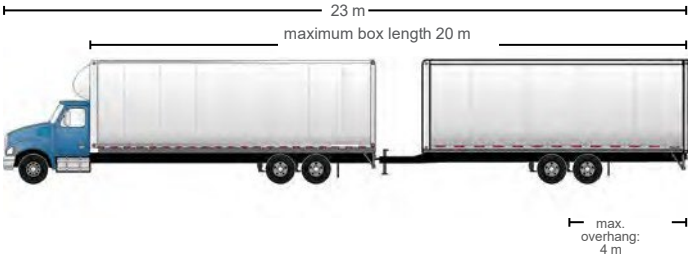


Buses

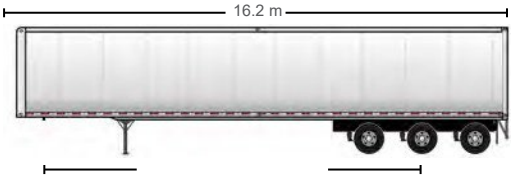
Trailer without a dolly



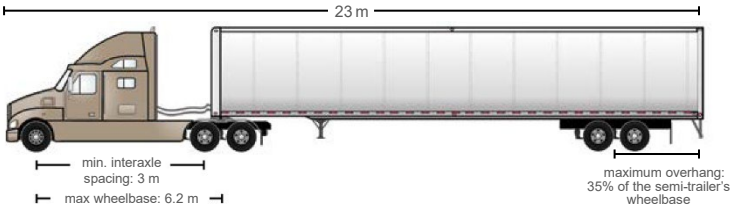
Trucks and trailers



Semi-trailers

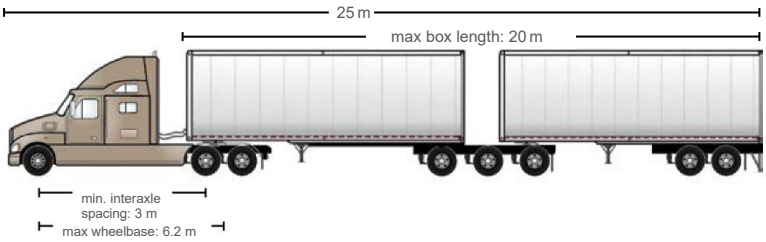


Tractors and semi-trailers



The overhang (including any part of the load that is longer than the semi-trailer) must not exceed 35% of the wheelbase, which is the distance between the centre of the single, tandem or tripe axle and the centre of the kingpin.

B-double road train



Special Travel Permits

Some road transportation vehicles are subject to specific regulations because their size or load exceeds the limits allowed under the *Vehicle Load and Size Limits Regulation*. These vehicles are considered outsized or overloaded and the owner or operator must obtain a special travel permit.

Special Class 1 to 7 travel permits

Class 1 to 7 travel permits are issued under the *Regulation respecting special permits*, which prescribes the conditions a vehicle must meet if it is outsized or overloaded due to its characteristics or because its load is indivisible.

Special permits issued under section 633 of the *Highway Safety Code*

These special permits are issued in exceptional circumstances, essentially for the purpose of allowing travel by experimental vehicles. They serve to harmonize Québec's standards with those of other jurisdictions and authorize the operation of a vehicle combination that is outsized because:

- the semi-trailer or semi-trailers are equipped with at least one lift axle;
- the tractor or semi-trailer is carrying a forklift at the rear;
- the tractor's wheelbase is greater than 6.2 m;
- the length of the B-double road train is more than 25 m;
- the combination of vehicles is carrying automobiles;
- the tractor is equipped with three axles at the rear.

Special road train operating permits

These permits are issued under the *Special Road Train Operating Permits Regulation*. We will come back to them later on in this chapter.

For more information on special travel permits, visit the website of the Ministère des Transports et de la Mobililté durable (www.transports.gouv.qc.ca).

Safeguarding Bridges and Overpasses

It is very important to respect load limits for bridges and overpasses. Two types of road signs indicate the load limit a bridge or overpass is able to support.

Weight restriction signs are found near certain bridges and overpasses. If you are driving a bus or truck that exceeds the total loaded mass indicated on the sign, you cannot use the bridge or overpass in question.

Weight restriction signs can also be found at intersections ahead of a bridge or overpass, in which case they are accompanied by a tab that indicates the direction of—and distance to—the bridge or overpass in question. This sign provides advance warning so that you can take a different route should your vehicle be too heavy.

Weight restriction signs can also be located at the approach to a bridge or overpass and accompanied by an "UN VÉHICULE À LA FOIS" tab. This tab is used when the structure cannot support more than one heavy vehicle at a time, even if the heavy vehicle's total loaded mass is under the posted limit.

> Weight restriction signs also apply to tow trucks, tool vehicles and equipment transport vehicles.

Weight restriction signs with the mention "EN SURCHARGE" are used near certain bridges and overpasses to indicate that heavy vehicles whose weight exceeds the load limits provided for under the *Vehicle Load and Size Limits Regulation* are not allowed to use the bridge or overpass in question.

To be authorized to cross a bridge or overpass with a vehicle that exceeds the maximum weight indicated on a weight restriction sign—or the legal limits in the case of a weight restriction sign bearing the mention "EN SURCHARGE"—you must hold a special travel permit issued specifically for that purpose. For more information, contact the Ministère des Transports et de la Mobilité durable.

For information about weight limits on bridges and overpasses, refer to the list on the website of the Ministère des Transports et de la Mobilité durable (www.transports.gouv.qc.ca).

The *Vehicle Load and Size Limits Regulation* prescribes the size, load per axle class and total loaded mass limits for vehicles used on public roads. You must ensure that the vehicle you are driving complies with the standards set out in this Regulation. In cases where the vehicle exceeds the prescribed limits, it is considered an outsized vehicle and the heavy vehicle operator must obtain a special travel permit authorizing the vehicle to be driven on public roads.

For more information on special travel permits, visit the website of the Ministère des Transports et de la Mobilité durable (www.transports.gouv.qc.ca).

Raised dump body light and sound warning system

Since September 1, 2020, all heavy vehicles (trucks, trailers and semi-trailers, as well as vehicle combinations with a total gross vehicle weight rating (GVWR) of 4,500 kg or more) with a dump body whose height exceeds 4.15 m when fully raised must be equipped with a light and sound warning system. Fines apply when vehicles subject to the *Regulation respecting dump body safety devices* are not equipped with the required safety devices.

Exercise 3.1

3.1.1 Match each of the road signs below with the corresponding description.

	Road Sign	Description (enter the corresponding letter)
1		
2		
3		
4		

Descriptions

A) This sign provides advance warning of a truck crossing where the stopping sight distance is insufficient.

B) This sign provides advance warning of a level crossing that is designed in such a way that heavy vehicle drivers must slow down to less than 70% of the posted speed limit in order to cross safely.

C) This sign provides advance warning of a curve designed in such a way that heavy vehicles with a high centre of gravity have a high risk of rolling over.

D) This sign means that loaded trucks may pull onto the public roadway from an access road ahead.

3.1.2 Match each description with the appropriate image and choose the correct answer sequence below.

1. This sign indicates a parking area reserved for trucks.

A.

2. This tab is placed below a road sign and means that the road sign does not apply to trucks.

B.

3. This sign reminds truck drivers that they are on a road that trucks are normally prohibited from using, except to make local deliveries.

C.

4. This sign reminds road users of the maximum quantities of certain dangerous substances that can be transported in a tunnel.

D.

5. This sign means that drivers of heavy vehicles equipped with a speed limiter must activate the device and set it at a speed that is not greater than the maximum speed shown on the sign.

E.

- ◯ **A)** 1A, 2B, 3C, 4D, 5E
- ◯ **B)** 5A, 4B, 3C, 2D, 1E
- ◯ **C)** 1B, 2D, 3A, 4C, 5E
- ◯ **D)** 1E, 2C, 3A, 4B, 5D
- ◯ **E)** 1B, 2A, 3D, 4C, 5E

3.1.3 Choose the correct answer to each of the questions below.

1. In order to keep to your scheduled route, you would need to turn right at an intersection where this sign is posted. Are you authorized to turn right?

- ◯ **A)** Yes
- ◯ **B)** No

2. You are driving on a bridge with three lanes of traffic in your direction. This sign appears above one of those lanes. Can you use any of the available lanes if you are carrying dangerous substances requiring the display of safety marks?

- ◯ **A)** Yes
- ◯ **B)** No

3. You are driving a truck and the following sign is above the lane to your right. What should you do?

- ◯ **A)** Stay in your lane.
- ◯ **B)** Move into the lane to your right.

4. Your route includes a road where this sign is posted. You are carrying dangerous substances requiring the display of safety marks. Can you drive on this road?

- ◯ **A)** Yes
- ◯ **B)** No

5. You may come across this sign when driving a heavy vehicle in mountainous regions. What does this sign mean?

- ◯ **A)** You are about to drive up a steep slope and no action is required.
- ◯ **B)** You are about to go down a slope and must check your service and parking brakes beforehand.

6. You are driving an empty semi-trailer at the posted speed limit in the right lane. There is a truck ahead of you that is driving very slowly. Based on this road sign, are you authorized to pass the truck if you can do so safely?

- ◯ **A)** Yes
- ◯ **B)** No

The answer key is provided at the end of this guide.

3.1.4 Choose the correct answer to each of the questions below.

1. Your semi-trailer is equipped with six load-bearing axles. Are you able to drive during the day on a road where this sign appears?

- ◯ **A)** Yes
- ◯ **B)** No

2. Which load or size limit does this sign refer to?

- ◯ **A)** Total loaded mass
- ◯ **B)** Number of axles
- ◯ **C)** Total length
- ◯ **D)** Total width

3. Your truck is less than 25 m in length. Can you turn right?

- ◯ **A)** Yes
- ◯ **B)** No

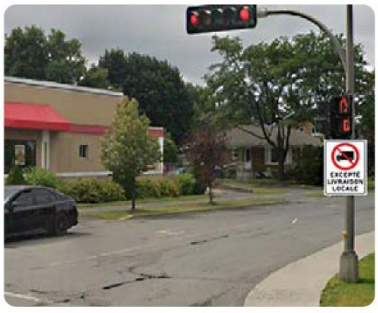
4. Your semi-trailer truck has a total loaded mass of 40,000 kg. If you do not take into account its height, can you cross this bridge?

- ◯ **A)** Yes
- ◯ **B)** No

5. What does the "EN SURCHARGE" sign mean?

- ◯ **A)** You cannot cross the bridge if your vehicle's total loaded mass is greater than the legal limit.
- ◯ **B)** You can cross the bridge if your vehicle's total loaded mass is greater than the legal limit, provided you have the appropriate special permit allowing you to do so.

6. You have just made a delivery on a street with this sign. There is a restaurant on this street. Are you authorized to go there for lunch?



- ◯ **A)** Yes
- ◯ **B)** No

7. Bernard is a self-employed trucker whose business is based out of his home in a residential neighbourhood where this sign appears. Can Bernard drive his truck home and park it there?

- ◯ **A)** Yes
- ◯ **B)** No

8. Martin wants to fill up his heavy vehicle at a service station in an area where this sign appears. Is Martin authorized to enter this area for that purpose?

- ◯ **A)** Yes
- ◯ **B)** No

9. Denis's truck is having mechanical issues. The nearest garage is on a street where truck traffic is prohibited except for local delivery. Is Denis authorized to go to that garage?

- ◯ **A)** Yes
- ◯ **B)** No

10. You are driving a heavy vehicle in a roadwork zone. Can you use the right lane when you see this sign?

- ◯ **A)** Yes
- ◯ **B)** No

11. This sign appears above the left lane. You are driving a heavy vehicle in the centre lane and the vehicle ahead of you is only going at 80 km/h. Can you use the left lane to pass the slower vehicle and then merge back into the centre lane?

- ◯ **A)** Yes
- ◯ **B)** No

12. Transporting dangerous substances requiring the display of safety marks is prohibited in the _____ indicated by the arrow.

- ◯ **A)** direction
- ◯ **B)** lane

13. When this sign appears above a traffic lane, this means that heavy vehicles are no longer prohibited from travelling in that lane.

- ◯ **A)** True
- ◯ **B)** False

14. Are you authorized to take Exit 133 with a heavy vehicle if you have no local deliveries to make?

- ◯ **A)** Yes
- ◯ **B)** No

15. Heavy vehicle traffic is prohibited from 7 p.m. to 7 a.m. Are you authorized to drive your heavy vehicle in this area at 1 p.m.?

- ◯ **A)** Yes
- ◯ **B)** No

The answer key is provided at the end of this guide.

3.1.5 Match each of the road signs or pavement markings below with the appropriate description.

	Road Sign or Pavement Marking	Description (enter the corresponding letter)
1		
2		
3		
4		

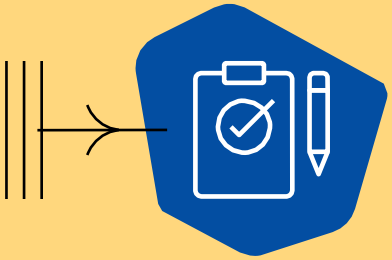
Descriptions

A) This road sign or pavement marking warns of a school bus stop ahead, where you may come across a bus that has stopped to take on or let off schoolchildren.

B) This road sign or pavement marking is used to mark stop zones for city buses.

C) This road sign or pavement marking warns of a reserved bus lane merging ahead.

D) This road sign or pavement marking indicates the presence of a parking area specially designed for people using public transit.



Exercise 3.2

Over the next few days, keep an eye out for some of the road signs covered in this section. Take photos and share them with your fellow students or your instructor.

Spring thaw restrictions

During the thaw each spring, road resistance decreases by 40% and roads become especially vulnerable to the weight of heavy vehicles. Each time a truck drives on a road during spring thaw, its impact on the pavement is equivalent to that of several trucks at other times of the year. A single overloaded truck during this period can cause serious road damage.

Limiting loads is therefore very important during the spring thaw period to compensate for the reduced load-bearing capacity of the weakened road infrastructure.

Load restrictions apply throughout Québec but differ from region to region. To factor in climate and weather conditions across its vast territory, Québec is divided into three major thaw zones, as illustrated below:

- **Zone 1**

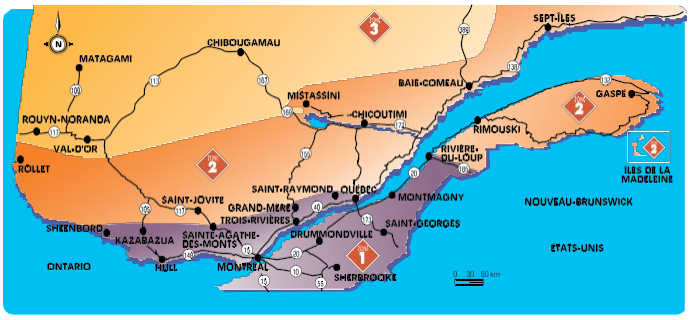
  This zone covers southern Québec, which includes the urban areas of Gatineau, Montréal, Sherbrooke, Trois-Rivières and Québec, and extends to Rivière-du-Loup.

- **Zone 2**

  This zone is located directly north of Zone 1 and includes the La Vérendrye and Laurentides wildlife reserves, along with the Témiscamingue, Saguenay, Lac-Saint-Jean, Côte-Nord, Rimouski, Gaspésie and Îles-de-la-Madeleine regions.

- **Zone 3**

  This zone is located north of Zone 2 and includes the Abitibi and Chibougamau-Chapais regions, as well as the Ashuapmushuan wildlife reserve.



All heavy vehicles are subject to these temporary - weight restrictions. Heavy vehicle operators are required to comply with the spring thaw load limits (total loaded mass) that apply based on a vehicle's configuration and the type of axle used. Authorized load limits are listed in the *Vehicle Load and Size Limits Regulation*.

The load restriction period is usually from March to May, but the beginning and end dates vary from year to year based on weather conditions. The zones themselves may also sometimes change.

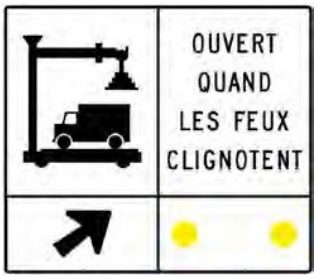
That is why it is important to consult the Ministère des Transports et de la Mobilité Durable's information service and information bulletins for details about the applicable load limits and when they apply.

Mandatory stops at inspection stations

You are required to stop at an inspection station when its lights are flashing if you are driving:

- a vehicle with a GVWR of 4,500 kg or more that is designed and equipped primarily for the transportation of goods
  or for the transportation of equipment that is permanently attached to the vehicle;
- a tow truck or a tool vehicle;
- a combination of road vehicles (e.g. a truck hauling a trailer), where at least one of the vehicles has a GVWR of 4,500 kg or more.

Certain exceptions apply. For example, trucks with a net weight of 4,000 kg or less registered as a passenger vehicle within the meaning of the *Regulation respecting road vehicle registration*, or road vehicles used for recreational purposes, are not required to stop at inspection stations.



Exercise 3.3

Indicate whether each of the following statements is true or false.

Statements	True	False
1. In Québec, heavy vehicle drivers must wear the seat belt installed by the vehicle manufacturer.	◯	◯
2. The *Highway Safety Code* requires heavy vehicle drivers to do a sight and sound inspection as part of the circle check, and to record their observations in the circle check report.	◯	◯
3. Drivers of straight-body trucks weighing 4,500 kg or more are not required to stop at an inspection station to have their vehicle and documents checked when the station's lights are flashing.	◯	◯
4. During spring thaw, a specific load restriction period applies to each thaw zone.	◯	◯
5. Drivers who have been involved in an accident are required to remain at the scene.	◯	◯

The answer key is provided at the end of this guide.

Rules for securing cargo

Under the *Highway Safety Code*, a vehicle's load must be:

- properly secured or covered so that no part of it can shift around or be dislodged from the vehicle;
- placed so as not to obstruct your field of vision, interfere with the vehicle's stability or handling, or block its lights;
- secured in compliance with the requirements of the *Cargo Securement Standards Regulation.*

The *Cargo Securement Standards Regulation*, developed by the Ministère des Transports et de la Mobilité durable, integrates the provisions of National Safety Code Standard 10, Cargo Securement, which applies throughout North America. It establishes the minimum requirements for securement systems and their use based on the type of vehicle used and the type of cargo transported. The objective is to prevent the cargo from shifting or tipping and ensure the vehicle's stability on the road.*

**For more information on this subject, we suggest you read the *Cargo Securement Guide*, published by the Ministère des Transports et de la Mobilité durable (www.transports.gouv.qc.ca).

General rules

The *Cargo Securement Standards Regulation* spells out the general standards that apply to all types of cargo transported by road vehicles or combinations of road vehicles with a GVWR of 4,500 kg or more. While the Regulation generally does not apply to farm vehicles or tractors and sided vehicles used to transport bulk cargo—provided certain conditions are met—the Regulation does include standards that apply specifically to the covering systems that must be used when transporting bulk cargo such as earth, sand, gravel, salt, bituminous concrete, road demolition waste, snow and ice.

Under these general standards, cargo must be firmly secured to or immobilized inside the vehicle transporting it. To ensure that the cargo remains immobilized during transportation, the tiedown system must meet certain performance criteria in order to counteract the forces (front, rear, lateral and vertical) applied to the cargo as a result of driving manoeuvres, road geometry, road surface conditions and wind.

The cargo may be secured or immobilized by structures of adequate strength, blocking systems, bracing, dunnage or dunnage bags, shoring bars, tiedowns, friction mats or a combination thereof.

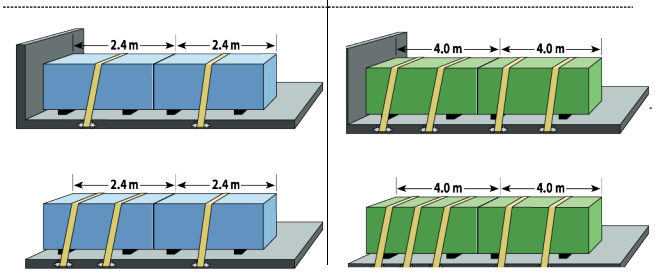
The securement system used must be appropriate for the size, shape and mass of the cargo. All of its components must be in proper working order, be designed for the purpose for which they are used and not have sustained any damage that could hamper their performance.

You must check the cargo and its securement system and make any necessary adjustments before setting out and at various moments during your trip. Note that you are not required to inspect the cargo if it is inaccessible or sealed in the vehicle and you have received instructions not to open the vehicle.

Cargo securement requires the use of a minimum number of tiedowns, which is generally determined based on the tiedown's strength and the mass and length of the cargo to be immobilized. The following rules generally apply:

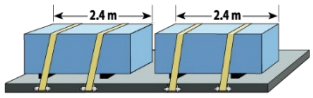
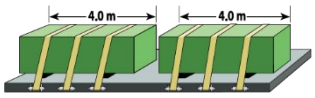
› **Where an article of cargo is blocked or immobilized** by a front-end structure, a bulkhead, another article of cargo that has been immobilized or any other device used to prevent it from shifting forward, it must be secured in the following manner, regardless of its mass:

Article up to 3.04 m in length	Article longer than 3.04 m
Use at least one tiedown.	Use one tiedown for the first 3.04 m segment and an additional tiedown for each additional 3.04 m segment or fraction thereof.



› **Where an article of cargo is not blocked or immobilized** by a front-end structure, a blocking system or another article of cargo that has been properly secured, and provided the article is not more than 1.52 m in length:
  - at least one tiedown is required if the article's weight is 500 kg or less;
  - at least two tiedowns are required if the article's weight is over 500 kg.

Regardless of weight, articles over 1.52 m in length must be secured as follows:

Article longer than 1.52 m and up to 3.04 m in length	Article longer than 3.04 m
Use at least two tiedowns.	Use two tiedowns for the first 3.04 m segment and an additional tiedown for each additional 3.04 m segment or fraction thereof.
	

All tiedowns (straps, chains, and so on) used in accordance with the *Cargo Securement Standards Regulation* must bear a label or mark from the manufacturer certifying their working load limit (WLL). The WLL is the maximum load that a tiedown or securement system can handle under normal use, as certified by the manufacturer.

The sum of each WLL of all the tiedowns used to secure an article or a group of articles on a vehicle is the total WLL. The total WLL of the tiedowns used in a tiedown system must not be less than 50% of the total mass of the cargo secured by that system. For example, for a cargo with a mass of 2,268 kg, the tiedown system must have a total WLL of 1,134 kg or more.

Uncertified strap

Strap certified by the manufacturer

Sided vehicle

If cargo is transported inside a closed vehicle, it must be distributed so as to cover all of the space available inside the vehicle. Articles must be immobilized by direct contact with the walls of the vehicle or with other articles of cargo. If the type of goods being carried cannot be distributed to cover the entire space inside the vehicle, immobilization devices can be used, such as blocking systems, bracings, dunnage or dunnage bags, shoring bars, tiedowns or a combination of these devices.

For goods that are transported on a flatbed vehicle, tiedowns must be used to properly secure all articles of cargo to the vehicle.

Flatbed vehicle

If the cargo or any article of cargo is in danger of shifting around during transportation, it must be immobilized with chocks, wedges, cradles or other securement devices.

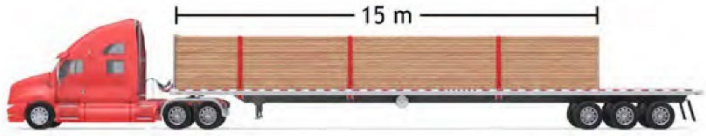
Exercise 3.4

In each of the following cases, indicate whether the load is properly secured and explain your answer. The tiedowns each have a WLL of 2,248 kg. Consult the *Cargo Securement Guide* as required.

1

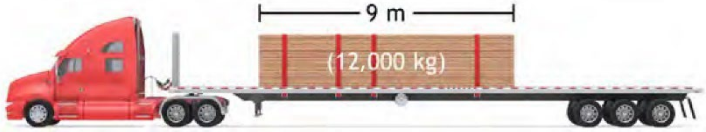
Is this load properly secured ◯ Yes ◯ No

2



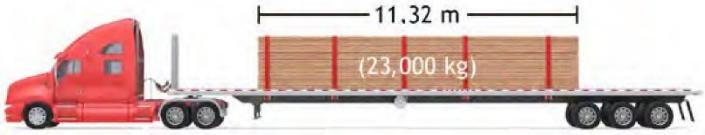
Is this load properly secured ◯ Yes ◯ No

3



Is this load properly secured ◯ Yes ◯ No

4



Is this load properly secured ◯ Yes ◯ No

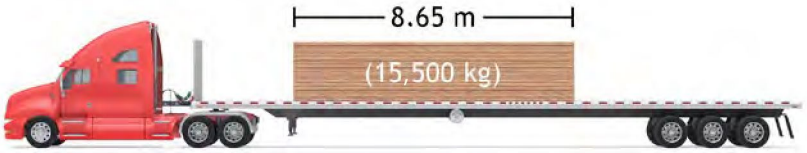
5

Is this load properly secured ◯ Yes ◯ No

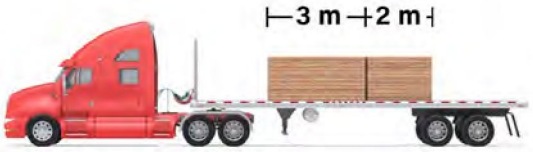
Exercise 3.5

Determine the minimum number of tiedowns required for each load.
Note that the WLL of each tiedown is 2,500 kg.

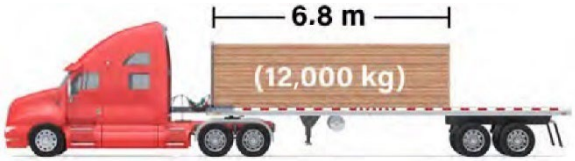
1



2



3



4

5

Special rules for the securement of certain types of cargo

To prevent articles from becoming dislodged, you must know how to properly secure cargo and comply with the special rules that apply to each type of load you are carrying. These rules were established to accommodate the specific type of articles contained in a load.

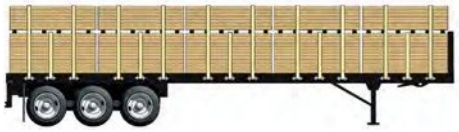
Given the wide variety of loads and the number of cargo securement methods available, the following pages focus solely on certain general characteristics of the different types of cargo for which special securement rules have been established.*

* For more information on the way to secure each type of cargo, refer to the *Cargo Securement Standards Regulation* or the website of the Ministère des Transports et de la Mobilité durable at www.transports.gouv.qc.ca.

Logs

The term “log” refers to a felled and delimbed tree trunk or section of tree trunk, whether or not it has been stripped of its bark. It also includes public utility poles, butt-treated poles and poles used as construction material in roundwood buildings. In the case of tree trunks, logs are both cylindrical and tapered. Properly securing a cargo of logs requires a combination of tiedowns and blocking systems such as stakes and bunks.

Dressed lumber

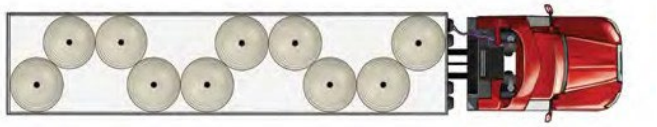


The transportation of bundles of dressed lumber presents special securement issues. Such bundles are usually stacked one on top of the other and secured by tiedowns spanning the tops of the bundles. Stacking bundles makes for a higher centre of gravity and also reduces the effectiveness of the tiedowns, since it is difficult to install tiedowns on stacked bundles with uniform tension over all the articles secured. To account for the special configuration of this type of cargo, the Regulation prescribes special securement standards for a cargo of dressed lumber bundles stacked more than one layer high.

Metal coils

Metal coils are heavy cylindrical objects. Whether loaded vertically or horizontally, their special features require you to use effective immobilization devices and a minimum number of tiedowns for each coil.

Paper rolls



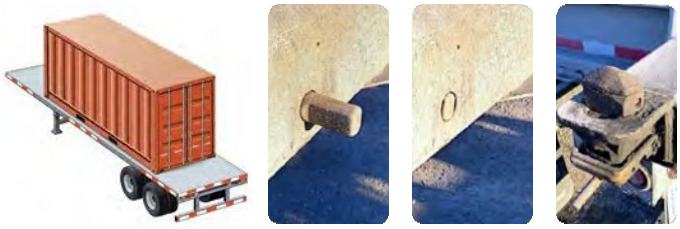
A paper roll is a heavy cylindrical object that is rather fragile due to the very nature of the product. Because of these characteristics, a cargo of paper rolls is usually transported inside a van or intermodal container, and the Regulation provides special rules to ensure that such loads are firmly immobilized or secured inside the vehicle.

Special securement standards are also prescribed for the transportation of paper rolls on flatbed vehicles where there are no sides to hold the cargo in place.

Concrete pipes

A concrete pipe has a cylindrical shape and its outer texture has a high friction coefficient. Large-diameter pipes may be transported one per vehicle, but small-diameter pipes can be loaded several to a vehicle, braced against one another and stacked. Regardless of how they are positioned, concrete pipes must be secured to prevent them from shifting or rolling around. The Regulation prescribes special securement standards for loads comprised of small- and large-diameter concrete pipes.

Intermodal containers



An intermodal container is a metal box of standardized dimensions used to transport cargo. It is equipped with integral locking devices so that it can be secured to a container chassis vehicle or flatbed vehicle. In view of their characteristics, the Regulation prescribes special securement standards for intermodal containers.

Roll-on/roll-off containers (removable containers)

A roll-on/roll-off container is a specialized container that has integrated rollers enabling it to be loaded onto or unloaded from a tilt frame body by using a lifting device. This type of container is transported by vehicles specially adapted to secure the container at the front and at the rear. The Regulation prescribes special securement standards for the types of containers transported on such adapted vehicles.

Vehicles transported as cargo

Vehicles with an individual mass of 4,500 kg or less

A vehicle with an individual mass of 4,500 kg or less is generally made up of moving mechanical parts that enable it to be driven. Some of these parts (tires, suspension, etc.) allow free vertical movement. Because of these characteristics, transporting such vehicles requires the use of special securement systems.

Flattened or crushed vehicles with an individual mass of 4,500 kg or less

A flattened or crushed vehicle is a road vehicle that has been compressed mechanically to reduce its volume and facilitate its storage and transportation. This process results in the crushing or dislocating of parts that are integral components of the vehicle. After being flattened or crushed, the vehicles can then be stacked for transportation. Components can become dislodged from the vehicles during transportation when subjected to the external forces generated by a heavy vehicle in motion. In view of these characteristics, the Regulation prescribes special securement standards for the transportation of such vehicles.

Vehicles with an individual mass greater than 4,500 kg

Like lighter vehicles, vehicles with an individual mass greater than 4,500 kg are generally made up of moving parts that enable them to be driven. This category of vehicle also includes tracked machinery or equipment. Some of the moving parts (tires, suspension, etc.) allow free vertical movement. Because of these characteristics, transporting such vehicles requires the use of special securement systems.

Boulders

A boulder is a large, irregularly shaped rock that is naturally occurring or extracted from a quarry. The rules concerning the securement of boulders apply to boulders with a mass of 5,000 kg or more, or a volume above 2 m^3. Boulders with a mass above 100 kg and below 5,000 kg can also be secured in accordance with the same provisions.

Although its shape may be similar to that of other boulders, each boulder is unique (shape, mass, etc.). In view of these characteristics, the Regulation contains special securement standards for transporting boulders.

Bulk cargo

The term “bulk” covers several types of products (aggregates, liquids, gases, granular products, etc.) that are piled or poured in for transportation. Certain types of bulk cargo are transported in a dump truck, a container or other type of receptacle whose upper part is totally or partially open. The Regulation prescribes special standards for covering bulk cargo carried in these types of receptacles.

Exercise 3.6

Proper cargo securement

Look for a heavy vehicle with a load that has already been secured. Is the load properly secured? Explain your answer. If possible, take photos of the securement devices and tiedowns used. Share your photos and discuss the example. with your fellow students or instructor. As required, propose adjustments that would ensure the load is properly secured. Repeat this exercise three or four times with a variety of loads whose dimensions, mass and shape are all different.

Securement inspection

As required under the *Cargo Securement Standards Regulation*, you must inspect the vehicle prior to departure and during the trip.

You must perform a visual inspection to ensure that the vehicle's tailgate, tailboard, doors, tarpaulins, spare tire, tire rack and other equipment used in operating the vehicle are secured. You must also ensure that the cargo:

› does not interfere with your ability to drive the vehicle safely;

› does not hinder anyone from freely exiting the vehicle's cab or driver's compartment.

Inspection of cargo and the cargo securement system

You must also inspect the vehicle's cargo and the cargo securement system used. You must make any necessary adjustments:

› before driving the vehicle;

and

› not more than 80 km from where the cargo was loaded.

You must reinspect the cargo and cargo securement system and make any necessary adjustments (including adding more tiedowns), whenever:

› your duty status changes;

› the vehicle has been driven for three hours;

› the vehicle has travelled 240 km.

Under the Regulation, you are only exempt from inspecting your cargo and the cargo securement system if:

› the cargo is sealed in the vehicle and you have been ordered not to open it to inspect the cargo.

› the vehicle is loaded in a manner that prevents you from accessing the cargo or portions of the cargo.

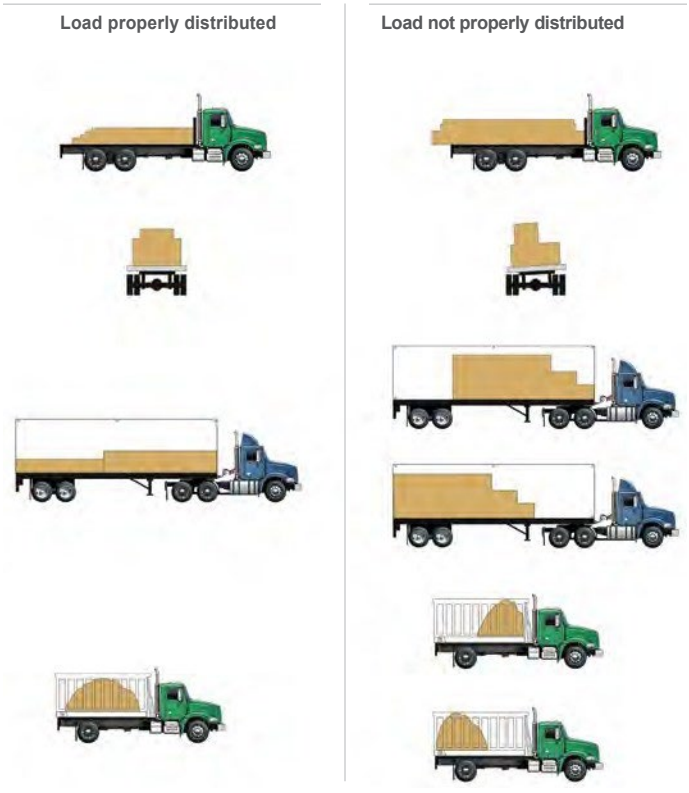
Tips for proper load distribution

Load distribution can affect your vehicle's stability and manoeuvrability. The weight of the load and the location of its centre of gravity can affect how easy it is to handle the vehicle. It is therefore essential to distribute the load so that its centre of gravity is as low as possible.

For easier vehicle handling and to ensure compliance with regulatory load limits, cargo should be loaded so that its weight is distributed as evenly as possible over each axle. Overloading the front axle, for example, can make steering difficult and damage the axle or tires.

Similarly, too much weight on the rear axles can reduce front wheel traction and make handling the vehicle harder.

If there is not enough weight on the drive wheels, the vehicle can skid, especially on a slippery road surface. A load that is not properly distributed or secured is liable to shift around or be dislodged from the vehicle, which would displace the centre of gravity and jeopardize the stability of the vehicle and its load.



LOADS OVERHANGING THE REAR OF THE VEHICLE

You must place a red flag or reflective panel at the rear end of any load or equipment that overhangs the rear of the vehicle by more than one metre.

Also, if you are driving your vehicle with such a load at night, you must install a red light at the end of the load. The light must be visible from behind and from both sides from at least 150 metres away.

If the equipment or load cannot be arranged without overhanging the rear of the vehicle by more than two metres, a special travel permit must be obtained and you must comply with the special rules for this type of permit.

Rules for transporting dangerous substances

Regulations governing the transportation of dangerous substances

If you **transport dangerous substances**, you must be aware of your obligations under the legislation governing the transportation of such substances. In accordance with this legislation, you must receive training on any dangerous substances you are asked to transport, and you must hold a training certificate issued by your employer that confirms you have received the appropriate training.

Anyone who handles and transports dangerous substances (or offers such substances for transportation) on Québec's public roads must comply with Québec's *Transportation of Dangerous Substances Regulation* all the way from the manufacturing or distribution site to the delivery or unloading site. The Regulation provides for certain exceptions, depending on the type or quantity of dangerous substances being transported. Note that the standards prescribed by the federal *Transportation of Dangerous Goods Regulations* form an integral part of Québec's Regulation.

This section provides information about your obligations and responsibilities as a driver under Québec's *Transportation of Dangerous Substances Regulation*.

Training for drivers who transport dangerous substances

If you are asked to transport dangerous substances, your employer must make sure that you receive training directly related to the duties and tasks you will have to perform. The training must also be tailored to the type of dangerous substances you will be transporting.

Your employer must issue you a training certificate confirming that you have received training on the transportation of dangerous substances, specifying the areas in which you have been trained, the subjects covered by the training and the certificate's expiry date.

The certificate is valid for 36 months. As a driver, you must carry the original or a copy with you whenever you transport dangerous substances in your vehicle, or else you must be with someone who is carrying the original or a copy of their own training certificate and be under their direct supervision.

Shipping document

Whenever you take charge of a shipment of dangerous substances, you must make sure the shipper gives you a copy of the shipping document, which must contain the information required by the *Transportation of Dangerous Substances Regulation*. This document must remain with the dangerous substances until they are delivered.

› When you are on board the vehicle, the shipping document must be stored in a protective jacket affixed to the driver's side door or must be within easy reach.

› When you are not in the vehicle, the document can be placed in either one of the following locations:

- in a protective jacket affixed to the driver's side door;
- on the driver's seat or in a location where it will be visible to anyone who climbs into the vehicle from the driver's side.

Labelling dangerous substances

In general, dangerous substances must be labelled using the safety marks prescribed by the *Transportation of Dangerous Substances Regulation*.

Before taking possession of dangerous substances, you must make sure that:

- the dangerous substances have been classified;
- the shipper has affixed the appropriate safety marks on the containers (label, placard or sign);
- the shipper has provided placards to be displayed on the vehicle. These placards must be placed on each end and on each side of the vehicle.

Class 1 – Explosives

1.1
Substances or articles with a mass explosion hazard (e.g. T.N.T.)

1.2
Substances or articles with a projection hazard, but without a mass explosion hazard (e.g. military shells)

1.3
Substances or articles with a fire hazard and either a minor blast or projection hazard, or both, but not a mass explosion hazard (e.g. fireworks)

1.4
Substances or articles with no significant hazard outside their packaging should they be ignited or triggered during transport (e.g. safety fuses and firearm bullets)

Placards are not required for Class 1.4:

- if the quantity of Class 1.4 substances or articles is equal to or less than 1,000 kg;
- if the substances or articles are of Class 1.4S, regardless of quantity.

1.5
Very insensitive substances that nonetheless have a mass explosion hazard (e.g. blasting agents)

1.6
Extremely insensitive articles with no mass explosion hazard (e.g. articles containing insensitive detonating material, extremely insensitive explosives)

Before driving a vehicle transporting any of the explosives listed in the *Regulation under the Act respecting explosives*, you must first obtain authorization from the Sûreté du Québec.

Class 2 – Gases

2.1
Flammable gases (e.g. propane)

2.2
Non-flammable non-toxic gases (e.g. nitrogen)

Placards or labels must be used for the following four oxidizing gases:

- compressed oxygen;
- refrigerated liquid oxygen;
- compressed oxidizing gas;
- liquefied oxidizing gas.

2.3
Toxic gases (e.g. carbon monoxide)

Class 3 – Flammable liquids

Liquids with a flash point equal to or lower than 60.5°C (e.g. gasoline, ethanol, kerosene and diesel fuel)

Class 4 – Flammable solids, substances liable to spontaneous combustion and substances that release flammable gases on contact with water

4.1
Flammable solids (e.g. safety matches)

4.2
Spontaneously combustible substances, (e.g. activated carbon)

4.3
Water-reactive substances
(e.g. sodium)

Class 5 – Oxidizing substances and organic peroxides

5.1
Oxidizing substances
(e.g. ammonium nitrate)

5.2
Organic peroxides
(e.g. benzoyl peroxide)

Class 6 – Toxic and infectious substances

6.1
Toxic substances (e.g. arsenic and pesticides)

6.2
Infectious substances (e.g. rabies virus)

Class 7 – Radioactive materials

Substances defined as radioactive materials in the *Packaging and Transport of Nuclear Substances Regulations* (e.g. uranium hexafluoride, nucleodensimeter).

Category I – white (label or placard)

Category II – yellow (label or placard)

Category III – yellow (label or placard)

Fissile materials category - white (label or placard)

Class 8 – Corrosives

Corrosive substances (e.g. sulfuric acid)

Class 9 – Miscellaneous products, substances or organisms

Miscellaneous products, substances or organisms (e.g. polychlorinated biphenyls (PCBs) and asbestos)

Special rules for transporting dangerous substances

This section outlines the general points you should be aware of if you drive a heavy vehicle carrying dangerous substances. For more information on each type of cargo, refer to the *Transportation of Dangerous Substances Guide* available from the Ministère des Transports et de la Mobilité durable.

Cargo securement

All containers used to transport dangerous substances and all other objects must be secured or immobilized by means of structures of adequate strength, blocking systems, bracings, dunnage or dunnage bags, shoring bars or tiedowns, or a combination thereof.

Containers of dangerous substances must not be placed on or in front of a motor vehicle's front bumper.

Cargo inspection by a peace officer

Under the *Highway Safety Code*, if a peace officer asks to inspect your cargo, you must obey the officer's instructions and, if so directed, pull over and stop your vehicle. You must also show the officer all the documents concerning the cargo.

If so requested by a peace officer, you must also present the certificate showing that you have received the necessary training to transport dangerous substances.

Dangerous substances and road trains

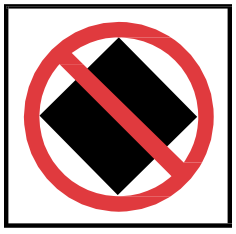
Under the *Transportation of Dangerous Substances Regulation*, the transportation of dangerous substances is prohibited in the following vehicles:

- a road train more than 25 m in length (called a "long combination vehicle") if safety marks must be displayed in accordance with Part 4 of the *Transportation of Dangerous Goods Regulations*;
- a double road train tank truck, unless it is a B double road train (not more than 25 m long).

Prohibition from transporting dangerous substances in certain tunnels

Under the *Transportation of Dangerous Substances Regulation*, you are strictly prohibited from transporting dangerous substances in the following tunnels:

- Melocheville (Beauharnois);
- Louis-Hippolyte-Lafontaine (Montréal);
- Ville-Marie (Montréal);
- Viger (Montréal);
- Joseph-Samson (Québec).



This prohibition applies in the following situations:

› The quantity of dangerous substances you are carrying requires that safety marks be displayed on the vehicle, unless the vehicle is carrying only Class 9 dangerous substances.

› You are carrying a Class 3 flammable liquid and the total capacity of all the containers exceeds 30 L.

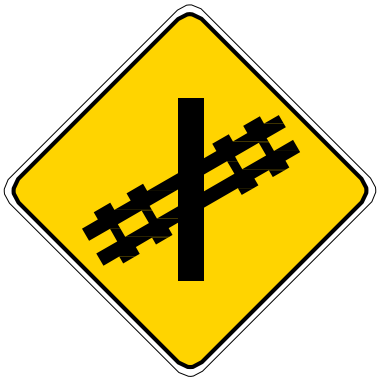
› You are carrying Class 2.1, 2.3 (2.1), 2.2 (5.1) or 2.3 (5.1) gases in more than two cylinders or in a cylinder with a water capacity exceeding 46 L.

› You are carrying equipment that generates a naked flame or contains incandescent solid fuel.

Given that certain exemptions apply, we recommend you refer to the *Transportation of Dangerous Substances Regulation* to determine if any of these exemptions applies to your situation

Mandatory stops at level crossings

If the quantity of dangerous substances transported requires the display of safety marks on the vehicle, you must stop at level crossings. You can only proceed through the level crossing once you have made sure that it is safe to cross.

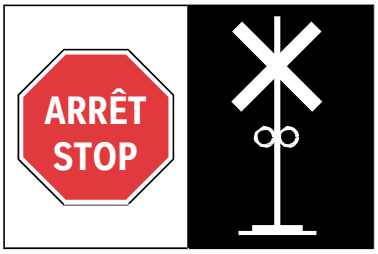


To warn other road users, you should display a sign at the rear of the vehicle, such as one that says:

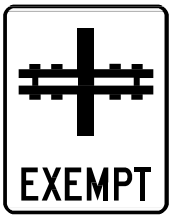
CE VÉHICULE S'ARRÊTE AUX PASSAGES À NIVEAU
(this vehicle stops at level crossings)

or

ARRÊT AUX PASSAGES À NIVEAU
(stops at level crossings)



You can drive through a level crossing without stopping only where the following road sign indicates that it is permitted to do so.



Accidental spill of dangerous substances

If you are handling or transporting dangerous substances and there is a loss, release or leak of dangerous substances, or if an accidental spill of dangerous substances occurs and the quantity discharged exceeds the limits specified in the Regulation, you must immediately notify:

- the local police;
- your employer;
- the shipper of dangerous substances;
- the owner or lessee of the vehicle;
- CANUTEC, in the case of infectious substances or if the substances were discharged from a damaged gas cylinder (1-888-CAN-UTEC or *666 on a cell phone).

To find out what quantities of discharged dangerous substances require you to immediately notify these authorities, refer to the *Transportation of Dangerous Substances Regulation*.

Transporting liquefied petroleum gas cylinders

If you transport cylinders of liquefied petroleum gas, you must comply with the following rules:

- Do not transport the gas cylinders in a vehicle, unless the gas cylinder containment area has outside ventilation.
- Any gas cylinder placed on the outer rear section of the vehicle must be protected by extending the bumper beyond the cylinder using materials at least as strong as those of the bumper.
- Never transport a cylinder:
  - mounted on the vehicle's roof or on one of its doors;
  - mounted in front of a motor vehicle's front axle;
  - that extends beyond either side of the vehicle.

For more information about transporting dangerous substances, refer to the *Transportation of Dangerous Substances Guide*, available from the Ministère des Transports et de la Mobilité durable. The guide can be consulted online at www.transports.gouv.qc.ca. You can also refer to this website for the most up-to-date information about transporting dangerous substances.

Transportation to the United States

Carriers that transport dangerous substances to the United States must register each year with the U.S. Department of Transportation (USDOT) if the substances transported meet any of the following criteria:

- They belong to Class 7 (regardless of their quantity).

- They consist of over 25 kg of Class 1.1, 1.2 or 1.3 explosives

- They consist of over 1 L of products that are toxic when inhaled.

If you transport these types of dangerous substances to the United States, you must carry a certificate from your employer showing that you have received appropriate training.

Safety tips for transporting certain categories of goods

Livestock

Livestock transported by truck must be restrained or in cages to avoid any risk of the vehicle overturning.

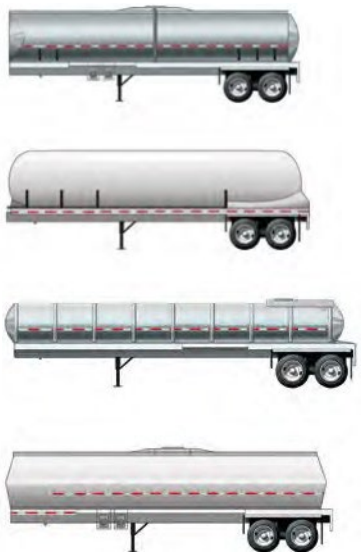
Dry bulk in tank trucks

Because tank trucks have a high centre of gravity, you should avoid sudden steering or braking movements when negotiating a curve or turning at an intersection.

Liquids in tank trucks

Transporting liquids or liquefied gases by tank truck requires special skills. Here are a few explanations to acquaint you with how liquids move around inside a tank, as well as tips for safe driving.

Differents types of tanks



Driving carefully

The movement of a liquid in a tank and the vehicle's high centre of gravity create special driving conditions. If a tank is only partly full, you should avoid sudden steering or braking movements, since the liquid's movement can directly affect your control of the vehicle.

How changes in temperature affect liquids

To comply with the maximum load limit specified by the manufacturer on the safety certification label, you must take into account the liquid's density and temperature when filling the tank. Some liquids expand when exposed to heat or cold and must be maintained at a controlled temperature.

Some liquids, such as sulfuric acid, are denser than water and might cause your vehicle to exceed authorized weight limits. You must be aware of the properties of your cargo so that you can take the proper precautions. You should know how these liquids react to changes in temperature and be careful not to fill your tank completely. Never fill a tank to more than 70% of its capacity.

Distribution of liquids in a tank

If a tank has several compartments, take special care to make sure the liquid is distributed evenly in each compartment. To load and unload your vehicle safely, you must make sure the weight is distributed evenly in the tank and avoid placing too much weight at the front or the rear.

Displacements of liquids in a tank

Controlling a tank truck requires you to drive smoothly, especially when braking or negotiating a curve. When you brake, the liquid forms a wave that travels forward until it strikes the front of the tank and then rebounds toward the rear. When the wave strikes the front or rear end of the tank, it exerts thrust in that direction.

You should also be especially careful in a sharp curve, when exiting a limited-access highway and when turning at an intersection, especially if the tank is only partly full.

To minimize displacement of liquids, some tank compartments have walls with holes in them, referred to as "baffles," which stabilize the liquid, yet allow it to move throughout the tank. Side-to-side liquid displacement still occurs, however, and can be powerful enough to overturn the vehicle, especially in a curve or turn.

You must therefore reduce your speed well below the maximum speed limit, especially in slippery road conditions.

Reflective strips

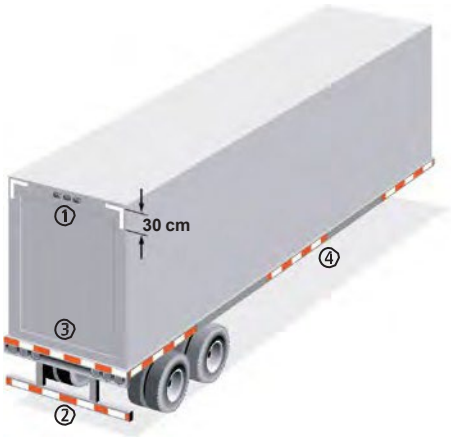
Other than trailers designed exclusively for use as a dwelling and construction site trailers, all trailers and semi-trailers with a width of 2.05 m or more and a GVWR of more than 4,536 kg must be equipped with reflective strips in accordance with the *Motor Vehicle Safety Act*. Notwithstanding the exception indicated above, construction site trailers with a width of more than 2.6 m that travel at night must be equipped with reflective materials on each of their longest sides, in accordance with the standards set forth in the regulations made under the *Motor Vehicle Safety Act* with respect to trailers covered by the Act.

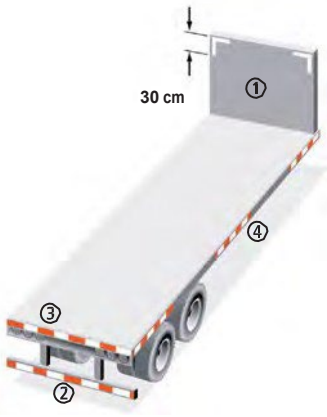
In some cases, a series of reflectors may be used instead of reflective strips. The centre of each reflector must be spaced no more than 100 mm from the centre of the adjacent reflectors.

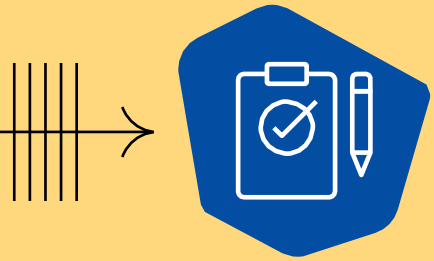
School buses are not required to have reflective strips; however, if they do, the strips must be yellow.

Heavy vehicle owners and operators must comply with the following standards:

	Location of reflective strips	Height	Colour
1	Along the horizontal and vertical edges of the rear upper corners, as viewed from the rear	At the top	White
2	Horizontally across the full width of the rear impact guard	No requirement	Red and white
3	Across the full width of the rear of the vehicle	As horizontal as possible and between 375 mm and 1,525 mm from the ground, or as close to that height as is possible	Red and white or, on the lower rear and the side of the trailer body, solid white, solid yellow, or yellow and white
4	Along the entire length of each side, beginning as close to the front and ending as close to the rear as possible, with the strip being either continuous or consisting of equally spaced segments that all together cover at least 50% of the vehicle's total length	As horizontal as possible and between 375 mm and 1,525 mm from the ground, or as close to that height as is possible	Red and white Yellow and white Solid white Solid yellow







Exercise 3.7

Indicate whether each of the following statements is true or false.

Statements	True	False
1. The same cargo securement methods can be used for any type of load.	◯	◯
2. If cargo has been properly secured before leaving, there is no need to check it during your trip.	◯	◯
3. When transporting dangerous substances, you must carry a certificate attesting that you have received the necessary training (or the person accompanying and supervising you must carry their own certificate).	◯	◯
4. If the tank of a truck carrying liquids is equipped with baffles, the movement of the liquid inside the tank cannot cause the vehicle to overturn.	◯	◯
5. A carrier enforcement officer can inspect a heavy vehicle that shows signs of excessive emissions and can issue an offence report.	◯	◯
6. When transporting dangerous substances, you must stop your heavy vehicle at all level crossings, unless otherwise indicated.	◯	◯
7. The total loaded mass can be obtained by adding the mass of the load to the vehicle's mass.	◯	◯
8. When approaching a vehicle whose rotating lights are activated, you must move over as far as possible without slowing down.	◯	◯
9. The total WLL of all the tiedowns used in a tiedown system must be at least 25% of the total weight of the cargo secured by the system.	◯	◯
10. Your load exceeds the rear of your vehicle by more than one metre. You must place a red flag at the very end of the section of the load that extends beyond the rear of your vehicle.	◯	◯

The answer key is provided at the end of this guide.

Long combination vehicles (LCV)

The loads and sizes of some double road trains (generally those over 25 m in length) exceed the standards set by the Ministère des Transports et de la Mobilité durable.

In this chapter, these outsized double road trains are referred to as “long combination vehicles” (LCVs). To operate an LCV, you must comply with the conditions of the *Special Road Train Operating Permits Regulation*. You must also hold a Class 1 driver’s licence bearing the T endorsement. To be eligible for the T endorsement, you must have held a Class 1 driver’s licence for at least five years and have successfully completed special training.

This chapter provides an overview of important things you should know about driving LCVs, such as:

- the types of LCVs covered by the *Special Road Train Operating Permits Regulation*, along with their size and other characteristics;
- the roads on which you are authorized to drive an LCV;
- the conditions you must comply with when operating an LCV.

LCVs can carry a larger volume of cargo than regular double road trains. Because of their larger capacity, LCVs can transport the same amount of goods at a lower rate of fuel consumption and at lower labour and maintenance costs. These savings are one of the reasons why LCVs are popular with heavy vehicle operators.

However, LCVs are harder to operate due to the length and dynamic behaviour of this type of vehicle combination. To safeguard road users, if you become an LCV driver, you will have to comply with the specific requirements of the *Special Road Train Operating Permits Regulation*, in which case it will be important for you to have a thorough understanding of this Regulation, in addition to the rules of the *Highway Safety Code*.

Special operating permits

To operate an LCV (a double road train that exceeds the total loaded mass and length prescribed by the *Vehicle Load and Size Limits Regulation*), the operator or owner must obtain a special operating permit. This permit is issued by the Ministère des Transports et de la Mobilité durable and can be obtained on its website (www.transports.gouv.qc.ca).

When operating an LCV on the road network, you must carry the original permit papers and its appendices with you at all times.

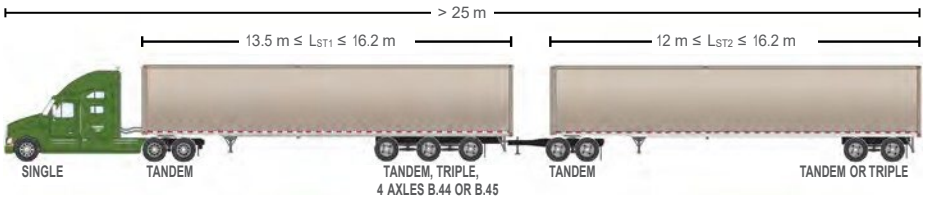
Special permit validity period

A special road train operating permit is valid for a maximum of 12 consecutive months.

Types of LCVs covered by the Regulation

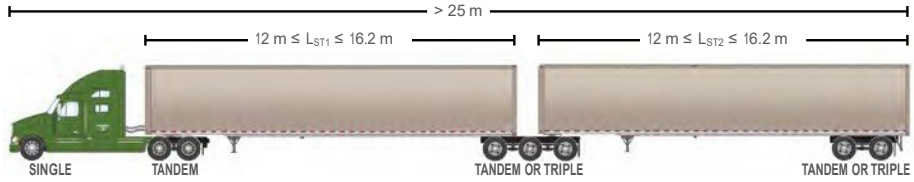
A special road train operating permit may be issued to authorize operation of the following types of LCVs:

A or C double road train LCVs



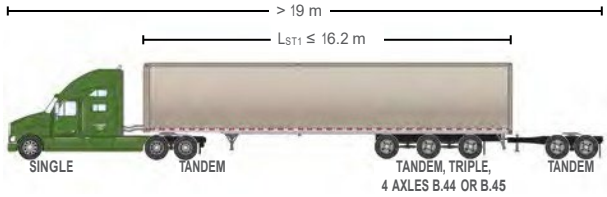
- **A-double road train LCVs** consisting of a tractor, a semi-trailer and a tandem-axle single drawbar dolly that converts the second semi-trailer into a trailer;
- **C-double road train LCVs** consisting of a tractor, a semi-trailer and a tandem-axle double drawbar dolly that converts the second semi-trailer into a trailer;

B-double road train LCVs



- **B-double road train LCVs** consisting of a tractor, a semi-trailer and a semi-trailer resting on a fifth wheel mounted at the rear of the first semi-trailer;

Other double road train LCVs



- **double road train LCVs** consisting of a tractor, a semi-trailer and a tandem-axle dolly.

Characteristics of LCVs

Total loaded mass

As a rule, the total loaded mass must not be more than 67,500 kg.

However, in the case of an LCV consisting of a tractor, semi-trailer and tandem-axle dolly (excluding the second semi-trailer), the total loaded mass must not be more than the maximum total loaded mass prescribed by regulation for that particular tractor and semi-trailer combination, plus 2,000 kg.

To find out more, refer ti the *Vehicle Load and Size Limits Regulation*.

Minimum horsepower of the tractor

The LCV's tractor must have at least 1 HP per 180 kg of total loaded mass. It must also be equipped with an air compressor with a capacity of at least 425 L per minute to supply the brake system.

Length of the first semi-trailer

The maximum length of the first semi-trailer is 16.2 m, but the minimum length varies depending on the type of LCV, as follows:

- 12 m for a B-double road train LCV;
- 13.5 m for an A or C-double road train LCV.

Length of the second semi-trailer

For all types of LCVs, the maximum length of the second semi-trailer is 16.2 m and the minimum length is 12 m.

Driver monitoring system

An LCV must be equipped with a device to track the driver's behaviour. This device must record relevant data concerning the date, time and speed, as well as any significant variations in speed.

Signage

A warning sign bearing the word "LONG" must be placed on the rear of the second semi-trailer. The sign must be 230 to 245 cm by 30 cm in size and comply with the manufacturing standards set forth in the *Special Road Train Operating Permits Regulation*. The sign must be rigid and must remain free of any object, substance or dirt.

Note that the warning sign is not required for an LCV made up of a tractor, semi-trailer and tandem axle dolly to which no second semi-trailer is hitched.

Load

The semi-trailer with the greatest total loaded mass must always be hitched to the tractor, except where the difference in mass between the two semi-trailers is less than 10%.

Travel in a straight line

Neither of the semi-trailers must be able to sway more than 80 mm out of line with the tractor to either side when the LCV is travelling in a straight line.

Dolly

If there is a dolly, it must be equipped with a pilot relay valve designed to boost the braking signal of the second semi-trailer. In the case of a C double road train LCV, the dolly must meet the requirements of section 903 of the *Motor Vehicle Safety Regulations* made under the *Motor Vehicle Safety Act*.

The axles of an LCV must also have the following characteristics:

- The **tractor** must be equipped with a front single axle and a rear tandem axle, have an interaxle spacing of at least 3.5 m (as measured from the axis of rotation of the single axle to the axis of rotation of the first axle of the tandem axle) and a wheelbase of 6.2 m or less (as measured from the axis of rotation of the single axle to the centre of the tandem axle).
- The **first semi-trailer** of a B double road train LCV must be equipped with a tandem axle or triple axle. The first semi-trailer of an A or C double road train LCV must be equipped with a tandem axle, a triple axle or a four-axle group with a load limit of 32,000 kg (Class B.44 or B.45 of the *Vehicle Load and Size Limits Regulation*).
- The **second semi-trailer** for all types of LCVs must be equipped with a tandem axle or triple axle.
- The **interaxle spacing** of the tandem axle or triple axle, as measured between the centre of the axis of rotation of each axle, must not exceed 1.85 m.

Despite the requirements listed in the second bullet above, the first semi-trailer of an A or C double road train LCV may be equipped with any combination of tandem or triple axles if it was manufactured before March 1, 1997. In such cases, the rules respecting interaxle spacing do not apply.

Roads where LCVs are authorized to travel

LCVs are only authorized to travel on the following roads:

- divided-lane limited-access highways and their entrance and exit ramps;
- road segments linking the entrance and exit ramps of limited-access highways in opposite directions;
- roads leading to a municipal industrial park, but only when accessed from a limited-access highway entrance or exit ramp, and only when the LCV travels on such a road for a distance of no more than 2 km;
- roads not referred to in the preceding point, but only when accessed from a limited-access highway entrance or exit ramp, and only when the LCV travels on such a road for a distance of no more than 500 m (for purposes such as going to a restaurant);

- roads located within a municipal industrial park;
- Route 271, in the municipalities of Laurier-Station and Saint-Flavien, over a southbound distance of 2 km from boulevard Laurier.

Roads where LCVs are not authorized to travel

Even when a special road train operating permit has been issued, LCVs are not authorized to use Exit 174 or 203 on Highway 40 to enter or exit that limited-access highway.

Obligations of special operating permit holders

The holder of a special operating permit must:

- provide the data stored or recorded by the driver monitoring system (which tracks the driver's behaviour) when so requested by a carrier enforcement officer or any other peace officer, in compliance with the officer's instructions;
- notify the Ministère des Transports et de la Mobilité durable of any accident or traffic jam caused by the LCV within two days of the incident;
- be the operator, within the meaning of the Act respecting owners, operators and drivers of heavy vehicles, of the tractor used in the LCV;
- ensure that the driver of the LCV complies at all times with the driving restrictions imposed by the Special Road Train Operating Permits Regulation (regarding roads, times of day and weather conditions).

Requirements

Driver's licence

To drive LCVs covered by the Regulation, you must hold a Class 1 driver's licence and have obtained the **T endorsement**.

To obtain a T endorsement, you must:

- have held a Class 1 driver's licence for at least five years;
- have completed the mandatory training program for drivers of LCVs (double road trains longer than 25 m) in one of the two road transportation training centres (Charlesbourg or Saint-Jérôme) that offer this program. For more information, contact those centres.

Load distribution in LCVs

In situations where you have to react quickly, you run the risk of losing control of the LCV you are driving if the load is not evenly distributed in the semi-trailers. As the driver, you are responsible for making sure the cargo is properly loaded and distributed. Depending on the company, you may be allowed to reposition the load yourself, or you may have to get someone else to do it.

To improve the stability of an LCV and prevent it from overturning, the centre of gravity must be as low as possible.

In short, to avoid braking, traction and steering problems, the load in each semi-trailer must be distributed properly over the axle groups in compliance with the *Vehicle Load and Size Limits Regulation*.

It is also very important to position the semi-trailers in an LCV based on their mass. The longest and heaviest semi-trailer must be hitched to the tractor. If the semi-trailers are not positioned in this order, you could lose control of the second semi-trailer when you brake.

Bear in mind that increasing a vehicle's load tends to reduce its ability to accelerate. This means that an LCV will require more time to enter the stream of traffic or to get back up to speed after stopping. The extra load also forces you to reduce your speed even more in curves.

Horsepower and speed

The toughest situations when driving an LCV often have to do with road conditions. Bumps, holes and ruts in the road can cause a rear semi-trailer to weave back and forth, with the risk of causing the vehicle to overturn.

To take into account the size of LCVs, their stability issues and the layout of roads, the Regulation sets a specific speed limit for LCVs. To safeguard other road users, the Regulation also requires you to maintain a certain distance from other vehicles when driving an LCV. You must:

- travel at a maximum speed of 90 km/h;
- maintain a distance of at least 150 m from any road vehicle ahead of you, except where you have to pass. In general, this is an adequate distance to enable you to brake safely and come to a stop with no problem.

As a safety precaution, you should maintain an even greater distance between your own vehicle and other vehicles when weather or road conditions so require.

The best way to reduce hazards related to road conditions is to choose the right cruising speed. The faster you drive, the less time you have to observe the road, spot or anticipate hazards and make the necessary evasive manoeuvres.

To help you maintain a reasonable speed, especially when driving up a hill or trying to reach your cruising speed, the *Special Road Train Operating Permits Regulation* requires a tractor to have a minimum of 1 HP per 180 kg of total loaded mass, which represents 375 HP for a vehicle combination with a total loaded mass of 67,500 kg.

Days and times of day when LCVs are prohibited

When driving an LCV, you must only drive on roads where LCVs are authorized, and you must also refrain from:

- driving on December 26 or statutory holidays;14
- driving on limited-access highways in the following metropolitan areas at the times indicated:
  - Québec: Monday to Friday from 6:30 a.m. to 9:00 a.m. and from 3:30 p.m. to 6:00 p.m.,
  - Island of Montréal: Monday to Friday from 5:30 am. to 9:30 a.m. and from 3:00 p.m. to 7:00 p.m.

Weather conditions

For safety reasons, you must only operate an LCV when:

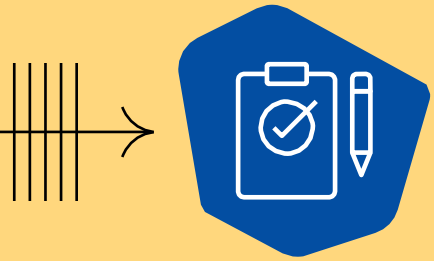
- visibility is clear for a distance of 500 m or more;
- the roadway is free of snow and ice.

LCVs may be operated year-round. However, during winter months (from December 1 to February 29), additional rules apply to both the holders of special road train operating permits and LCV drivers.

Transportation of dangerous substances

The transportation of dangerous substances is prohibited in an LCV if the quantity of dangerous substances requires the display of safety marks.S

14 Statutory holidays are set out in section 61 of the *Interpretation Act*.



Exercise 3.8

Indicate whether each of the following statements is true or false.

Statements	True	False
1. Anyone who holds a Class 1 licence can drive an LCV.	◯	◯
2. A special road train operating permit is required to drive an LCV.	◯	◯
3. The maximum total loaded mass authorized for an LCV is 67,500 kg.	◯	◯
4. The maximum speed you are authorized to travel at when driving an LCV is 90 km/h.	◯	◯
5. LCVs can be driven at any time, except during slippery road conditions.	◯	◯
6. On a double road train, you should hitch the lightest semi-trailer to the tractor.	◯	◯

The answer key is provided at the end of this guide.

Transportation of Passengers

If you are a bus driver, you bear a number of responsibilities with respect to passenger safety. Before allowing passengers on board any bus you are driving, you must make sure that it complies with all safety standards that fall under your responsibility. You also have to obey certain rules when picking up and dropping off passengers and throughout the trip.

If you are a school bus driver, this chapter also contains information intended specifically for you.

Laws and regulations

If you carry passengers, you must be familiar with the applicable laws and regulations to perform your work properly. The principal bodies responsible for administering or enforcing these laws and regulations are the Société de l'assurance automobile du Québec, the Ministère des Transports et de la Mobilité durable and the Commission des transports du Québec.

In addition to the *Highway Safety Code*, which applies to all drivers, if you are a professional driver who carries passengers, you are subject to other laws and regulations governing this form of transportation, including the following:

The *Transport Act*

This law specifies the powers and functions of the Commission des transports du Québec. It establishes requirements for school bus drivers, including that they successfully complete training and hold a certificate of competency, and it also determines which bodies may provide such training.

The *Bus Transport Regulation*

This regulation governs the issuing of permits for transporting passengers by bus.

The *Regulation respecting road vehicles used for the transportation of school children*

This regulation sets standards for the manufacturing, outfitting and use of school buses.

The *Regulation respecting the hours of driving and rest of heavy vehicle drivers*

If you are a bus driver, you are subject to this regulation unless you are employed in urban transit.

In addition to complying with Québec regulations, you must also obey the regulations in force in other jurisdictions when travelling outside Québec.

The *Regulation respecting safety standards for road vehicles*

This regulation requires that you perform a circle check not more than 24 hours before taking a bus out on the road, or that you read the report of the previous circle check and sign it, provided the previous check was done within the preceding 24 hours. If the owner or operator has designated someone else to do the circle check, as the driver, you must read the report completed by the designated person and sign it.

Number of passengers

The *Highway Safety Code* determines the maximum number of passengers allowed on a bus.

For buses used to carry school children, the number of passengers allowed corresponds to the number of places seated. When driving a school bus, you must not allow more than three school children per seat. There must be sufficient space for each child so that they can be seated safely without blocking the aisle.

For buses not used to carry school children, the following rules apply:

- For buses travelling outside an urban area (such as chartered and intercity buses), the maximum number of passengers allowed corresponds to the number of places seated, plus one place standing for each row of seats. For example, on a bus with 15 rows of seats, you may allow no more than 15 passengers standing in the aisle.
- For buses travelling in an urban area (such as public transit buses), the *Highway Safety Code* sets no limit on the number of passengers allowed on board.

Rules for operating a bus

Picking up and dropping off passengers

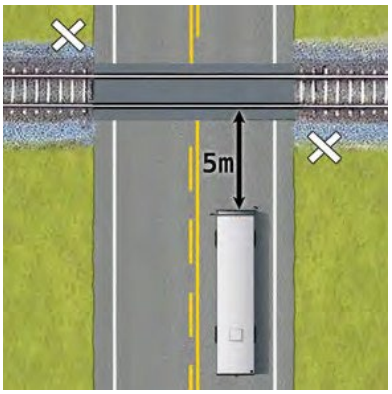
Before picking up or dropping off passengers, you must pull over and come to a full stop on the far right-hand side of the road or in a special area designated for that purpose. Once you have stopped, you may not open your door until you have made sure that it is safe to do so.

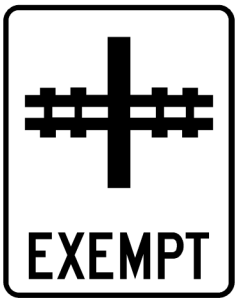
While driving

You should drive smoothly to ensure that your passengers are as comfortable as possible, and to avoid collisions and injuries. This is especially important when starting, stopping and turning, or when the road is bumpy.

There are various traffic rules you must obey to protect the safety of your passengers and other road users. For example:

- You must not drive on after stopping if anyone is leaning against the outside of the bus (such as on the bumper).
- Before driving on, you must make sure that none of the passengers you have just dropped off is at risk of being struck by the bus or getting caught underneath it.
- On roads within city limits where the posted speed limit is under 70 km/h, a bus has the right of way when pulling back into the lane it was using before it stopped. Nevertheless, you must use good judgment at all times and make sure you can pull back into your lane without endangering other road users. This means that before pulling away from the curb, you must make sure the way is clear and activate your turn signal lights.
- At level crossings, you must slow down and make sure you can stop without endangering other road users. You must stop your vehicle at least five metres from the crossing. You must not proceed until there is enough room ahead of you for you to clear the crossing completely, even if you are facing green traffic lights. You are exempted from this obligation only if there is an EXEMPT sign posted.
- Even though buses are subject to mechanical inspection rules, you do not have to stop at inspection stations, unless the bus is hauling a trailer.



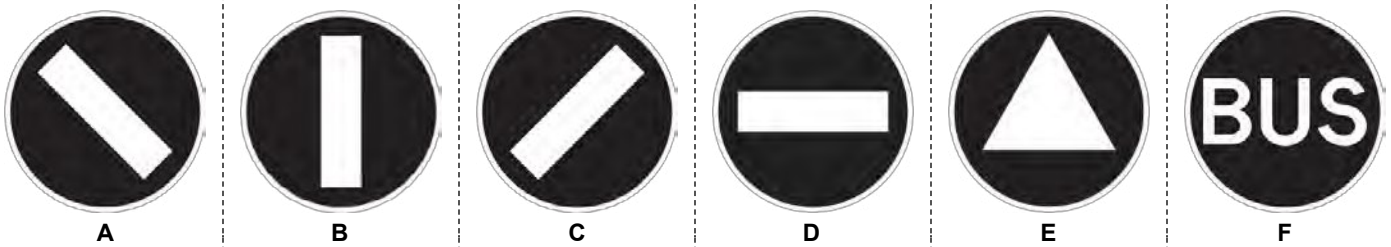


- When driving any vehicle with a total loaded mass of 3,000 kg or more, including a bus, you must pull over when you come to a brake check area designated by a VÉRIFICATION sign. You must check the brakes by coming to a full stop at the stop sign found in the brake check area. As a complementary measure, we recommend that you also follow the brake inspection procedure outlined in Chapter 6, which covers the circle check.

Exercise 3.9

Match each of the descriptions below with the corresponding traffic signal at the bottom of the page. Enter the appropriate letter in the space next to the description.

1. This signal means that buses are authorized to perform manoeuvres in all directions.	
2. This signal means that buses are granted extra time to exit an intersection (called a "clearance interval"). This light serves the same function as the yellow (amber) light for regular traffic.	
3. This signal means that buses are only authorized to turn left.	
4. This signal means that buses are only authorized to go straight. Left and right turns are prohibited.	
5. This signal means that buses are only authorized to turn right.	
6. This signal means that all priority manoeuvres for buses are prohibited.	



A B C D E F

Exercise 3.10

Match each of the descriptions below with the corresponding road sign at the bottom of the page. Enter the appropriate letter in the space next to the description.

1. This road sign indicates a parking area reserved for buses.	
2. This tab placed beneath a road sign means that the road sign does not apply to buses.	
3. This tab placed beneath a road sign means that the road sign does not apply to buses or minibuses.	
4. This tab placed beneath a road sign means that the road sign does not apply to public transit buses.	
5. This road sign indicates a route or lane that buses must use.	
6. This road sign means that access is prohibited to public transit buses.	

A

B

C

D

E

F

Exercise 3.11

Choose the correct answer.

1. This road sign means that access is prohibited to:

- ◯ **A)** trucks and minibuses
- ◯ **B)** all types of buses
- ◯ **C)** straight-body trucks and intercity buses
- ◯ **D)** trucks and intercity buses

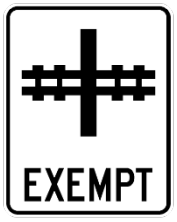
2. This road sign means that access is prohibited to:

- ◯ **A)** minibuses
- ◯ **B)** all types of buses
- ◯ **C)** school buses
- ◯ **D)** trucks and intercity buses

3. This road sign means that access is prohibited to buses and minibuses. The word BUS covers both buses and minibuses.

- ◯ **A)** True
- ◯ **B)** False

4. This road sign means that buses, minibuses and vehicles carrying some types of dangerous substances are not required to stop at the level crossing covered by the sign.



- ◯ **A)** True
- ◯ **B)** False

5. This road sign is placed at the beginning of sections of limited-access highways where buses and minibuses are authorized to drive on the shoulder.

- ◯ **A)** True
- ◯ **B)** False

Driving on the shoulder

You may drive a bus on the shoulder of a limited-access highway (or other limited-access road), provided all of the following conditions are met:

- You have successfully completed the required training course.
- The signage authorizes buses to travel on that section of the shoulder.
- Traffic on the limited-access highway is heavy and advancing at less than 50 km/h.

School transportation

The above rules apply to most types of buses, but there are additional rules that apply specifically to school buses. These rules are outlined below.

Driver training

As a school bus driver, you play an essential part in safeguarding your young passengers. Driving a school bus full of often boisterous children and making sure they are safe can be a challenge. Your task is a demanding one: you must remain patient and vigilant at all times. This is why you must be trained in the special skills this job requires.

A special 15-hour school bus driver training course has been developed to meet this need. The course covers the roles and responsibilities of school bus drivers, the rules regarding safety equipment, the techniques for picking up and dropping off school children, and what to do in the event of an emergency.

If you wish to drive buses or minibuses used to carry school children, you must hold a driver's licence of the appropriate class, pass the special bus driver training course at one of the two road transport training centres that offer it, and receive the certificate of competency issued by the training centre. Note that you must also renew your certificate every three years, which requires that you complete six hours of supplementary training.

To learn more, visit the SAAQ website (saaq.gouv.qc.ca).

As a school bus driver, you must be able to adjust to unforeseen circumstances, show tact and initiative in settling disputes, and know how to deal with unruly youngsters. You also need to know something about the behaviour of the school children you will be carrying.

Finally, you should be very familiar with the rules of the *Highway Safety Code* and with the transportation policy of the school board or school service centre for which you provide transportation.

Picking up and dropping off school children

When picking up or dropping off school children, you must first slow down and move over to the right side of the lane or into the school bus parking area.

There are always two steps involved in bringing the bus to a stop (unless you are driving a vehicle that carries wheelchair passengers exclusively):

1) You must first switch on the alternately flashing yellow warning lights to alert other drivers or cyclists that the bus is about to stop. (School buses built before August 29, 2005 are not equipped with alternately flashing yellow warning lights and are exempt from this requirement; however, their hazard lights must be switched on).
2) You must then switch on the flashing red lights and activate the mandatory stop sign. You must not pick up or drop off school children unless the flashing red lights are switched on.

You must also switch on your flashing lights and activate your stop sign if you are parked behind another school bus whose flashing lights are on, even if you are not dropping off or picking up any schoolchildren.

You may not use your flashing lights or stop sign in any other circumstances.

While driving

You must not drive on after stopping until you are sure that all of your passengers are seated and the bus door is closed. In addition, you must never leave your school bus if there are passengers still on board, unless absolutely necessary.

Mandatory equipment

You are responsible for making sure that your school bus is equipped with the following:

› three reflective warning triangles;

› one dry-chemical fire extinguisher installed inside the bus near the front door and properly secured in a box within reach of the driver. The extinguisher must be equipped with a pressure gauge (which must not point to “recharge” or “zero”) and it must be checked regularly to make sure it is ready to use;

› one complete first-aid kit solidly installed within reach of the driver. The contents of the kit are prescribed by regulation.

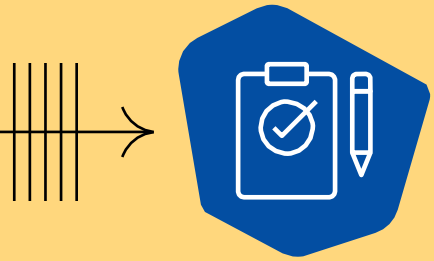
If you are using a school bus to carry school children or passengers under 18 years of age, you must make sure your vehicle is equipped with an ÉCOLIERS sign at the front and the back. If you are using a school bus to carry passengers who are all 18 or older, you must remove or cover up these signs.

Securing baggage

It is prohibited to carry any item weighing over 50 kg and having a volume of more than 0.450 m^3 inside a motor coach.

Any items carried on board a motorcoach must be distributed and secured in such a way that they cannot move around freely during the trip. If they come loose, they may cause injury to passengers or distract you from your driving.

If you carry packages and baggage in addition to passengers, you must stow these items in the compartments designed for that purpose.



Exercise 3.12

Indicate whether each of the following statements is true or false.

Statements	True	False
1. If you drive a school bus with 12 rows of seats, you can accept up to 12 standing passengers.	◯	◯
2. When driving a bus, you must stop where a "VÉRIFICATION" sign calls for the brakes to be checked if the bus you are driving has a total loaded mass of 3,000 kg or more.	◯	◯
3. If you drive a bus, you must stop your vehicle at least three metres from a level crossing.	◯	◯
4. It is prohibited to pick up or drop off school children with a school bus if the flashing red lights are not switched on.	◯	◯
5. If you have to stop your school bus behind another school bus that has its flashing lights on, you must switch your flashing lights on as well.	◯	◯

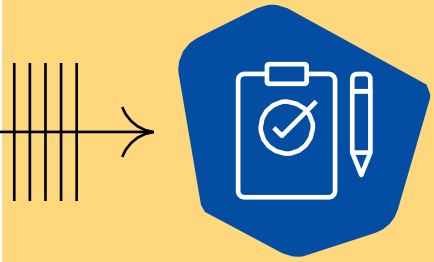
The answer key is provided at the end of this guide.

Driving and Off-Duty Time

Rules governing driving time, on-duty time and off-duty time help to limit the fatigue that heavy vehicle drivers may experience. Drivers who are tired pose a hazard to themselves and to other road users. The applicable standards are set forth in the *Regulation respecting the hours of driving and rest of heavy vehicle drivers.* The Regulation aims to:

- ensure heavy vehicle drivers have a minimum number of hours of rest before getting on the road;
- establish how long drivers may drive or be on duty before being required to stop driving.

> Since April 30, 2023, under the *Regulation respecting the hours of driving and rest of heavy vehicle drivers,* heavy vehicle drivers must record their hours of on-duty time, driving and off-duty time in a record of duty status, with a few exceptions. For this chapter, please refer to the *Driving and Off-Duty Time for Heavy Vehicle Drivers* guide.

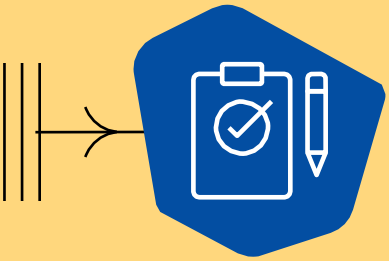


Exercise 3.13

Refer to the Driving and Off-Duty Time for Heavy Vehicle Drivers guide and indicate whether each of the following statements is true or false.

Statements	True	False
1. A work shift is the time between two periods of at least eight consecutive hours of off-duty time.	◯	◯
2. Any time spent waiting at the home terminal to begin a trip must be considered on-duty time.	◯	◯
3. To be authorized to drive, you must have taken at least 24 consecutive hours of off-duty time at some point during the preceding 14 days.	◯	◯
4. Once you accumulate 13 hours of driving time during a work shift, you must stop working.	◯	◯
5. You can drive 14 hours in the same work shift if you defer your off-duty time to the following day.	◯	◯
6. After 70 hours of on-duty time in Cycle 2, you must take 24 hours of off-duty time before going back on the road.	◯	◯
7. If you want to change the time a day begins, you must start a new cycle.	◯	◯
8. Breaks that are 15 minutes long count toward the two hours of rest that are not part of the eight consecutive hours of off-duty time you must take before starting a new work shift.	◯	◯

The answer key is provided at the end of this guide.



Exercise 3.14

Answer the following questions.

1. How many hours of driving are you authorized to do per work shift?	
2. How many hours of on-duty time are authorized per work shift?	
3. How many hours of off-duty time must you take before beginning a new work shift?	
4. How many hours of off-duty time must you take every day?	
5. How many hours of off-duty time must you take after working 14 days?	
6. Is the time spent filling out documents after making a delivery considered part of your hours of driving?	◯ Yes ◯ No
7. Does time taken for meals and breaks count when determining whether you meet work shift requirements?	◯ Yes ◯ No
8. Are only hours of driving time and hours of on-duty time taken into account when determining work shift requirements?	◯ Yes ◯ No
9. What is the maximum number of hours in a work shift?	
10. How many hours of on-duty time are authorized per cycle if you are following a 14-day cycle (Cycle 2)?	

The answer key is provided at the end of this guide.

Exercise 3.15

Answer the following questions.

1. How many hours of driving are authorized for the work shift on the second Saturday (shaded box)?

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
0	0	0	0	0	0	0
10	10	12	8	10	8	

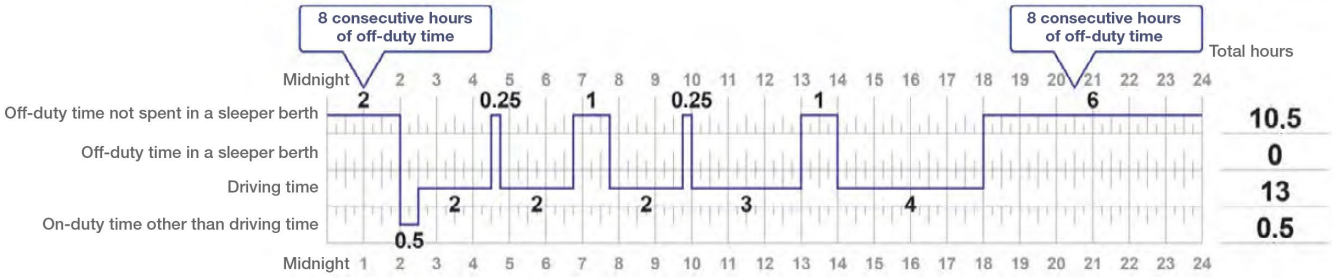
2. If you are following Cycle 2, how many hours would you be able to work on the fourth Sunday (shaded box)?

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
0	0	0	0	0	0	0
0	13	12	11	12	12	10
0	10	1	10	10	9	9

3. If you are following Cycle 1, how many hours would you be able to work on the second Thursday (shaded box)?

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
0	0	0	0	0	0	0
11	12	8	8			

4. For each of the off-duty and work shift requirements listed in the table following the record of duty status below, check off the ones that are met by the record of duty status, and then indicate whether the record as a whole complies with regulatory requirements.



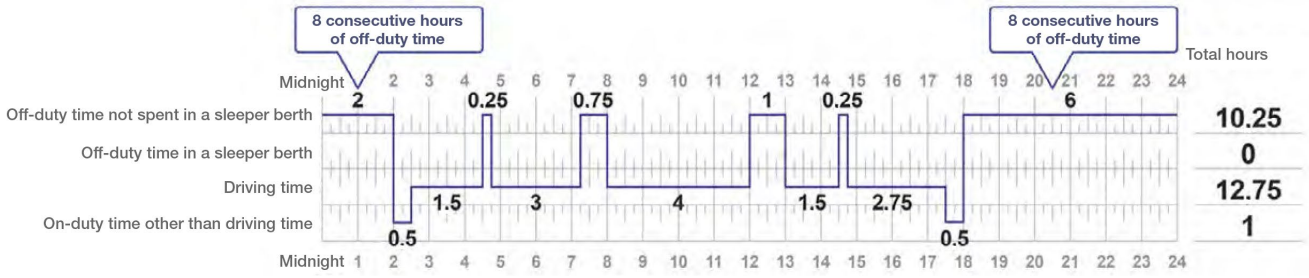
Off-duty requirement	Requirement met
At least 10 hours of off-duty time (daily requirement)	☐
At least eight consecutive hours of off-duty time before each work shift	☐
At least two hours of off-duty time not included in the eight consecutive hours required before each work shift (may be divided into breaks of no less than 30 minutes)	☐

Work shift requirement	Requirement met
No more than 13 hours of driving time	☐
No more than 14 hours of on-duty time	☐
No more than 16 hours between the start and end of the work shift	☐

◯ Compliant

◯ Non-compliant

5. For each of the off-duty and work shift requirements listed in the table following the record of duty status below, check off the ones that are met by the record of duty status, and then indicate whether the record as a whole complies with regulatory requirements.



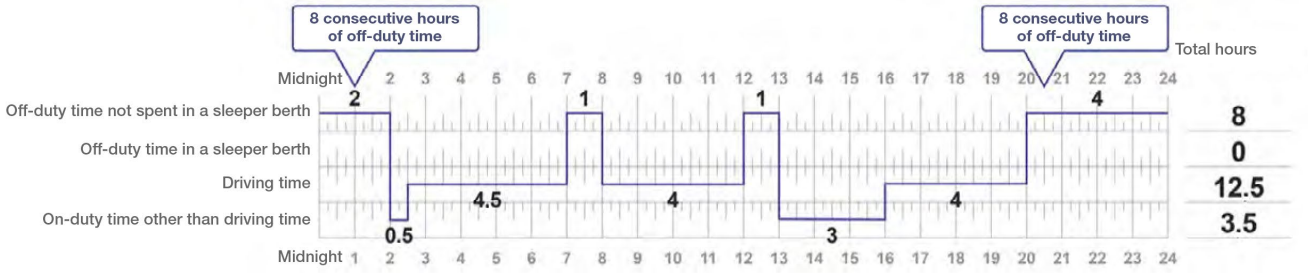
Off-duty requirement	Requirement met
At least 10 hours of off-duty time (daily requirement)	☐
At least eight consecutive hours of off-duty time before each work shift	☐
At least two hours of off-duty time not included in the eight consecutive hours required before each work shift (may be divided into breaks of no less than 30 minutes)	☐

Work shift requirement	Requirement met
No more than 13 hours of driving time	☐
No more than 14 hours of on-duty time	☐
No more than 16 hours between the start and end of the work shift	☐

☐ Compliant

☐ Non-compliant

6. For each of the off-duty and work shift requirements listed in the table following the record of duty status below, check off the ones that are met by the record of duty status, and then indicate whether the record as a whole complies with regulatory requirements.



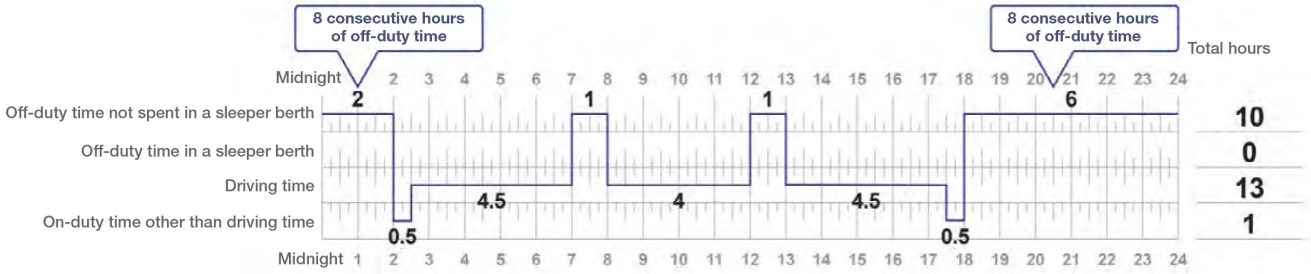
Off-duty requirement	Requirement met
At least 10 hours of off-duty time (daily requirement)	☐
At least eight consecutive hours of off-duty time before each work shift	☐
At least two hours of off-duty time not included in the eight consecutive hours required before each work shift (may be divided into breaks of no less than 30 minutes)	☐

Work shift requirement	Requirement met
No more than 13 hours of driving time	☐
No more than 14 hours of on-duty time	☐
No more than 16 hours between the start and end of the work shift	☐

☐ Compliant

☐ Non-compliant

7. For each of the off-duty and work shift requirements listed in the table following the record of duty status below, check off the ones that are met by the record of duty status, and then indicate whether the record as a whole complies with regulatory requirements.



Off-duty requirement	Requirement met
At least 10 hours of off-duty time (daily requirement)	☐
At least eight consecutive hours of off-duty time before each work shift	☐
At least two hours of off-duty time not included in the eight consecutive hours required before each work shift (may be divided into breaks of no less than 30 minutes)	☐

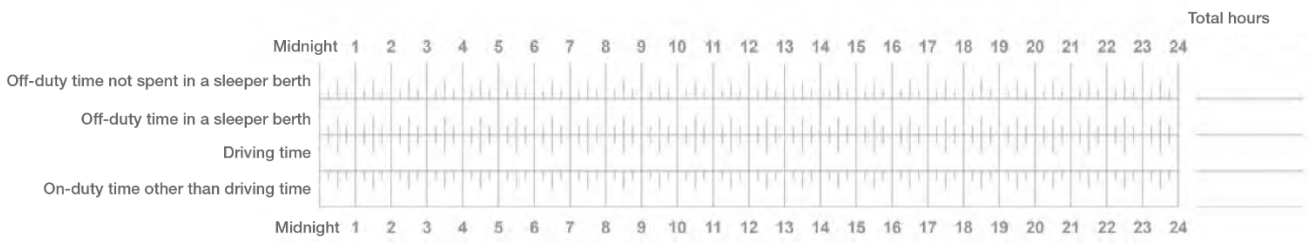
Work shift requirement	Requirement met
No more than 13 hours of driving time	☐
No more than 14 hours of on-duty time	☐
No more than 16 hours between the start and end of the work shift	☐

☐ Compliant

◯ Non-compliant

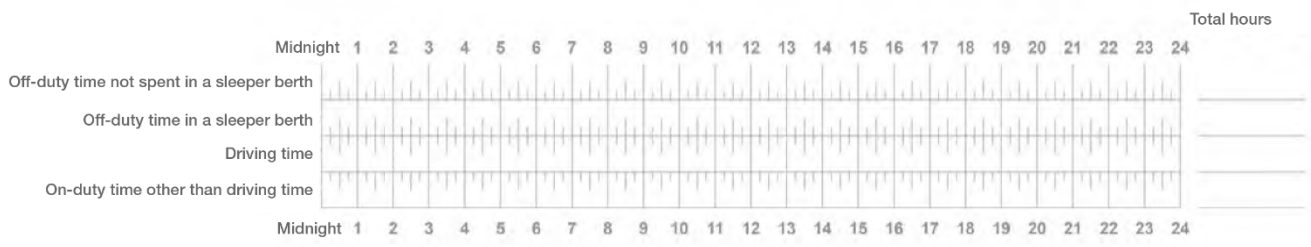
8. **After 10 consecutive hours of off-duty time, you begin your work shift at 8 a.m. Enter the appropriate duty status for each activity in the table, and then complete the corresponding record of duty status below.**

Activity	Duration	Duty Status
Inspection and hitching	30 minutes	*On-duty time other than driving time*
Driving	3 hours and 30 minutes	
Break	30 minutes	
Driving	1 hour and 30 minutes	
Meal	30 minutes	
Hitching and unhitching	30 minutes	
Driving	2 hours and 30 minutes	
Break	30 minutes	
Driving	3 hours	
Warehouse	1 hour	
Meal	2 hours	



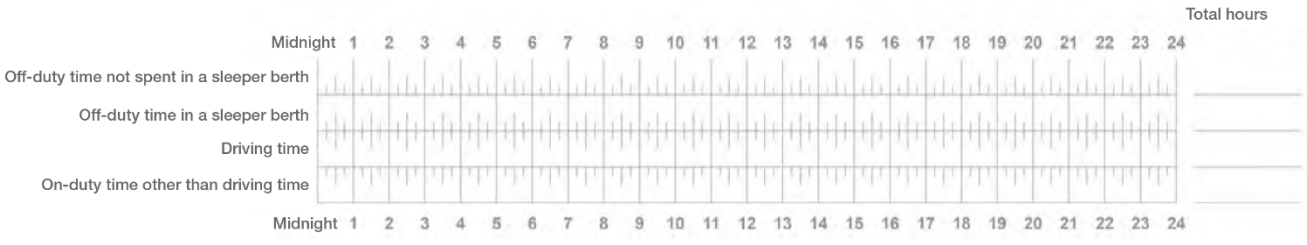
9. After 10 consecutive hours of off-duty time, you begin your work shift at 8 a.m. Enter the appropriate duty status for each activity in the table, and then complete the corresponding record of duty status below.

Activity	Duration	Duty Status
Inspection and hitching	30 minutes	*On-duty time other than driving time*
Driving	2 hours	
Break	30 minutes	
Loading	1 hour and 30 minutes	
Driving	2 hours	
Meal	1 hour	
Driving	2 hours	
Rest	30 minutes	
Unloading	1 hour and 30 minutes	
Driving	1 hour	
Hitching and unhitching	30 minutes	
Driving	1 hour	
Rest	2 hours	



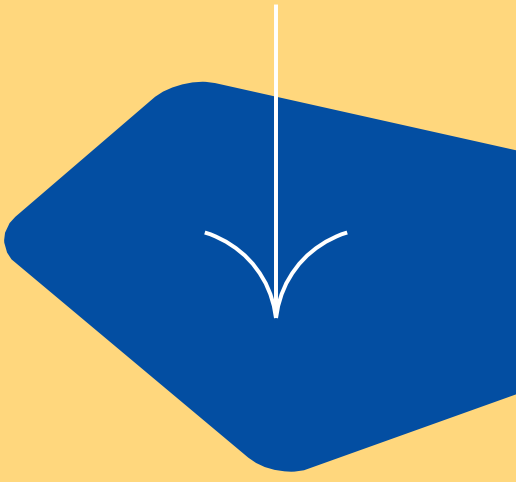
10. After 10 consecutive hours of off-duty time, you begin your work shift at 8 a.m. Enter the appropriate duty status for each activity in the table, and then complete the corresponding record of duty status below.

Activity	Duration	Duty Status
Inspection and hitching	30 minutes	*On-duty time other than driving time*
Driving	1 hour	
Break	30 minutes	
Driving	3 hours	
Sleeper berth	2 hours	
Refueling	30 minutes	
Driving	3 hours	
Break	30 minutes	
Driving	3 hours	
Sleeper berth	2 hours	



The answer key is provided at the end of this guide.

4 Getting Ready to Drive



Basic Driving Techniques

Driving a heavy vehicle requires basic knowledge, regardless of the type of vehicle. You need to master the basic skills that will allow you to control the speed and direction of your vehicle. Whether you are negotiating a curve, turning at an intersection or passing another vehicle, you need to know how to use the accelerator, steering wheel, brakes and transmission correctly.

In addition to these skills, you must learn how to observe your driving environment and adapt to it. When it has become second nature for you to check your blind spots, use your mirrors, signal your intentions and maintain adequate space around your vehicle, you will be prepared to cope with the most complex driving situations and react optimally. These skills and behaviours are essential for becoming a safe, cooperative and responsible professional driver.

Become a professional by adopting the right attitude from the very beginning of your driver training.

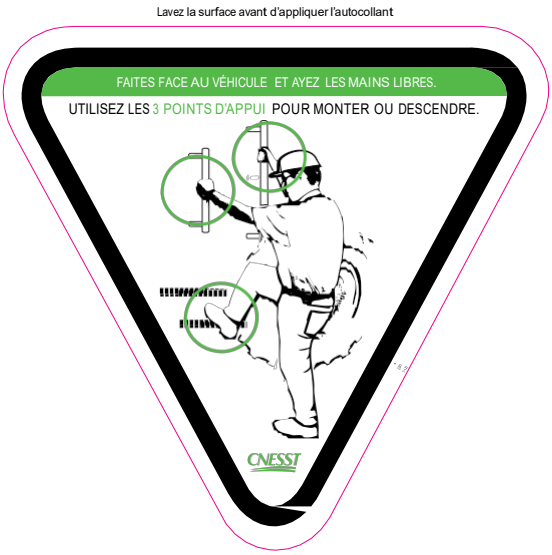
Getting in and out of the vehicle

The three-point contact method

For your safety, you should use the right technique to mount and dismount from a heavy vehicle.
The safest method to use is the three-point contact method, which requires you to have:

- both hands and one foot on the vehicle; or
- one hand and both feet on the vehicle.

The CNESST sticker below (in French only) provides a visual reference for the three-point method.



You need to take into account certain occupational health hazards when mounting and dismounting from a heavy vehicle. For example, falling or slipping may result in a back injury, sprain or bruising.

To reduce the risk of injury:

- As an anchor point, choose a fixed object, such as the grab handles, and avoid using the steering wheel.
  - Make sure the running boards are free of any slippery material (mud, ice, etc.).
- Install non-skid running boards that are wide enough to provide adequate foot support (wider than 18 cm).
- Use the three-point contact method when getting in or out of the cab.
- Step down from the cab backward rather than hopping from one step to another.
- Avoid placing obstacles in the footrests (e.g. a shoe brush).

Driver's seat

You can use various mechanical and pneumatic controls to adjust the driver's seat to suit your physique. Since you will be spending long periods of time behind the wheel, proper seat adjustment is important.

Take the time to adjust your seat before heading out. In doing so, you will reduce driver fatigue and the distraction caused by adjusting the seat while driving.

The ideal driving posture is to sit with your back straight against the back of the seat and your knees bent at a 90-degree angle. You should be able to easily slide your hand between the back of your knee and the seat. The seat must be positioned in a way that allows you to push the clutch pedal all the way to the floor without lifting yourself off the seat. The position of your foot on the accelerator is also important. The sole of your shoe should lie flat against the accelerator pedal with your heel on the floor.

Seat belts

Your seat belt keeps you safely seated and prevents you from violently striking the vehicle's interior in the event of a collision. You need to adjust your seat belt for your safety and comfort. The strap must be tight enough to hold your shoulder back if you need to brake abruptly.

Headrests

Headrests, like seat belts, are effective in preventing injuries. Most heavy vehicles have seats with a stationary headrest, but some have an adjustable headrest and you should adjust it properly before taking to the road. By taking this precaution, you can avoid whiplash or a painful neck injury in the event of a collision.

Side mirrors

Adjusting your mirrors will reduce the size of your blind spots. They should be adjusted before leaving when the vehicle is in a straight line. In some cases, trucks are equipped with convex side mirrors. Mirrors can be adjusted manually or electronically using a switch located on the inside panel of the driver's door or on the dashboard.

Adjusting your side mirrors

Although there is no formal mirror adjustment procedure, you should be able to see specific areas of your vehicle in your mirrors. You need to angle the mirrors in a way that allows you to see at least part of the trailer and the road behind you on both sides.

- Driver's side: the first axle or wheel of the road tractor should be visible in both the flat and convex mirrors.
- Passenger side: the first axle or wheel of the road tractor should be visible in the convex mirror only.
- The sides of the trailer must be visible in both mirrors. The mirrors should also give you a broad view of both sides of the trailer and the road.

> When properly angled, the visible portion of the trailer should not be wider than your finger.

Hand position

Driving a heavy vehicle requires special skills. Because they are so much bigger than most other vehicles on the road, it is especially important for you to operate your vehicle expertly and safely.

The main thing to remember is this: hold the steering wheel with both hands and vary your position while driving so that you can sit comfortably. Be sure also to grip the steering wheel with your hands positioned far enough apart on the wheel so that you can maintain firm steering control and react quickly no matter what happens.

Some models of heavy vehicles require the use of a special technique for making turns due to the size or configuration of the steering wheel they are equipped with. You must sit well back in your seat and keep your arms bent when turning the wheel. An easy way to achieve this is to start turning the wheel with your hands at the 8 o'clock/4 o'clock position. To turn right, for example, move your right hand from 4 o'clock to 6 o'clock. Then grip the wheel at 6 o'clock with your left hand and move it to 8 o'clock, while your right hand returns to 4 o'clock. Continue in this way until the vehicle's wheels are turned in the right direction.

Starting technique

The technique used to start a heavy vehicle is different from the one used for passenger vehicles. The technique also varies from one type of vehicle and transmission to another. Check the owner's manual to find out the appropriate technique for your vehicle.

Although there is no one way to start a heavy vehicle, here is an example procedure:

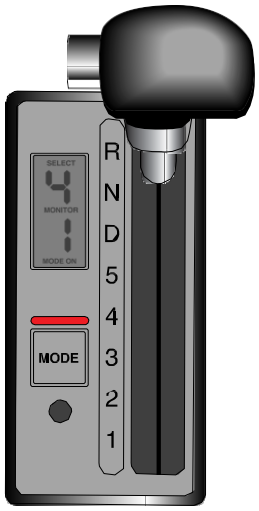
1) If the vehicle has a battery disconnect switch (circuit breaker), re-establish battery connection. This switch prevents battery drain when the vehicle is not in use.
2) Insert the key in the ignition, but do not turn it.
3) If the truck has an automatic transmission, shift into neutral (N).
4) If the truck has a manual transmission, press the clutch pedal. This reduces wear on the starter and minimizes load on the engine, especially in cold weather.
5) Turn the ignition key to the ON position and scan the dashboard indicators.
6) Turn the ignition key all the way to the right until the engine turns over.
7) Check the oil pressure gauge to ensure the engine has the proper oil pressure. Avoid letting the engine run if, after a few seconds, the gauge's needle reading indicates no oil pressure.

Automatic transmissions

Many vehicles are equipped with an automatic transmission. The transmission shifts gears based on the vehicle's travelling speed or the force of acceleration using mechanical, electronic or hydraulic controls. The shift pattern on the gear selector varies depending on the automatic transmission model.

Note that, unlike the automatic transmissions found in passenger vehicles, the automatic transmissions used in heavy vehicles do not have a "Park" position. To make sure the vehicle remains stationary when you are stopped, place the gear selector in the "N" (Neutral) position when the engine is running and use the parking brake to lock the wheels.

Another important point to note is that, when slowing down or downshifting in first and second gears, the drive wheels can lock up on a slippery roadway and cause you to lose control of your vehicle.



Mechanical gear selector

This model of gear selector is similar to the type usually installed in automobiles. The gear positions are as follows:

N (neutral)

For starting the engine, for idling for an extended length of time and for parking.

R (reverse)

For backing up (bring the vehicle to a full stop before using this gear).

2 to 5 or D

Forward gears to be used for normal driving conditions.

2 and 3 or 2 to 4

Lower gears for driving with loads.

2

The gear usually used for driving in snow or on a steep slope.

1

The gear that gives you the maximum vehicle power. It is used for driving very slowly under off-road conditions (bumpy or unpaved roads).

MODE

The button generally used to activate a program for using the transmission in Performance or Economy mode.

Electronic and electromechanical gear selector

Electronic and electromechanical gear selectors are operated by means of buttons rather than a lever. This type of gear selector has the same positions as a mechanical gear selector, but also two additional buttons: ↑ (up) and ↓ (down).

These buttons allow you to manually select a gear that is higher or lower than the gear automatically selected. In this way, you can select any gear (1 to 5) depending on road conditions,as explained in the previous section on mechanical gear selectors.

Before selecting a gear, you must first press the MODE button to switch from automatic to manual.

Automated manual transmission

More and more heavy vehicles are equipped with automated manual transmissions. This type of transmission constantly monitors various factors that have an impact on gear shifting, such as changes in the slope of the road, vehicle weight and speed, and rolling resistance. Because it is a “smart” transmission, it can analyze all these factors to determine when engine parameters are just right for the smoothest transition from one gear to another.

Manual transmissions

There are two types of manual transmissions found on heavy vehicles: synchromesh and non-synchromesh. Manual transmissions (and certain automated manual transmissions) are equipped with a clutch pedal.

Using the clutch pedal

The clutch pedal controls the clutch, which couples the engine to the transmission and transmits power to the drive wheels. When the pedal is raised in normal driving position, the clutch is engaged and power is transmitted to the wheels. When you press down on the clutch pedal, the clutch is disengaged, the engine is uncoupled from the transmission and power is no longer transmitted to the wheels, which is the equivalent of shifting into neutral. Only then can you shift gears with a manual transmission.Your driving position is crucial for proper clutching.

You must be seated in such a way that you can press the pedal down far enough to disengage the clutch completely, while maintaining your knee slightly bent.

When driving a heavy vehicle, you must avoid:

- forcing the transmission by releasing the clutch pedal too quickly;
- allowing the transmission to slip by releasing the pedal too slowly because such friction could generate excess heat and prematurely wear out the clutch plate;
- resting your foot on the clutch pedal when not using it (this may cause needless wear on the clutch);
- pushing the clutch pedal all the way to the floor when shifting gears.

Synchromesh manual transmission

A synchromesh manual transmission usually has five or six gears. A synchromesh inside the gear box enables you to shift gears without grinding. Using this type of transmission requires a clutch pedal similar to that of passenger vehicles and does not require you to use the double-clutching technique.

Non-synchromesh manual transmission

A non-synchromesh manual transmission usually has eight to 18 gears.

Because it is not equipped with a synchromesh enabling you to shift gears without grinding, you must use the double-clutching technique for safe and efficient driving.

Using a non-synchromesh manual transmission

To use a non-synchromesh manual transmission, you must be familiar with the principal features of your vehicle's engine, clutch pedal and transmission.

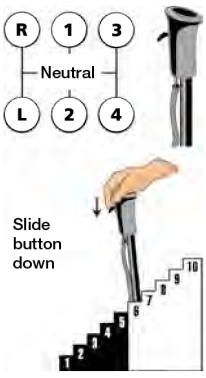
Engine

The principal characteristics of your engine you need to know are the number of revolutions per minute (RPM) when it is at idling speed and at top speed and its maximum torque. You must check your engine's RPM each time you shift gears. You must be able to quickly refer to the tachometer on your dashboard when shifting gears.

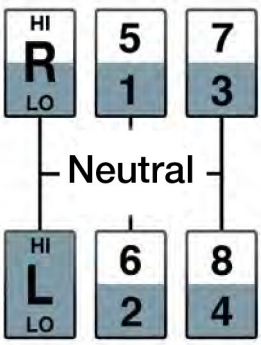
Transmission

The transmission multiplies engine power and transmits it to the differential. The vast majority of non-synchromesh manual transmissions are configured in one of the following two ways:

10- and 15-gear transmissions generally follow this model.



8-, 13- and 18-gear transmissions usually follow the layout shown below.



To shift into higher gears on flat terrain, you need to increase the engine speed between each gear by approximately:

- 300 RPM with a 10- or 15-speed transmission.
- 400 RPM with an 8-, 13- or 18-speed transmission.

Four-position clutch pedal

The clutch pedal in a non-synchromesh manual transmission has four positions, each of which plays a specific role. In order to apply the double-clutching technique properly and efficiently, you must understand how each of these four positions is used:

1) **Upper free play**
   Prevents certain components from constantly spinning, which creates unwanted friction.
2) **Friction point**
   Uncouples the engine from the transmission before you change gears.
3) **Lower free play**
   Makes the transition from the friction point to the clutch brake.
4) **Clutch brake**
   Stops the motion of certain components of the transmission so that you can shift into first gear.

Double-clutching technique

To use the double-clutching technique, you have to understand how to upshift and downshift.

The examples used in this section assume you are driving a vehicle equipped with a 10-gear transmission and an engine functioning as follows:

- idling speed: 600 RPM;
- top speed: 1,800 RPM;
- maximum torque: 900 RPM.

After shifting into first gear, to shift gears efficiently, you need to reach the following engine speeds:

1) 700 RPM to go from first to second;
2) 800 RPM to go to third;
3) 900 RPM to go to fourth;
4) 1,000 to 1,200 RPM to go to fifth (high range).

Upshifting into first gear (low range)

1) Press the clutch pedal down to the lower free play position (Position 3), or to the clutch brake (Position 4) if there is grinding as you are shifting into first gear.

2) Slowly release the clutch pedal up to the friction point (Position 2) until the vehicle starts moving.

3) Gradually press down on the accelerator while also gradually releasing the clutch pedal.

Upshifting into second gear

Based on the parameters in the example given above, to shift into second gear, you would need to reach an engine speed that is about 100 RPM higher than idling speed, so the ideal moment for shifting gears would be when the engine's speed reaches 700 RPM. Note that when you are on the point of shifting, it is difficult to do so if the difference between the actual RPM at that moment and the RPM necessary for the manoeuvre (according to the number of gears of the transmission) is lower than the RPM at idling speed (in the current example you would be able to shift into second without difficulty because 700 RPM – 100 RPM = 600 RPM).

To upshift into second gear, you must:

1) Press down on the accelerator until the engine reaches 700 RPM.
2) Press the clutch pedal down to the friction point (Position 2), and then continue pressing the clutch pedal down to the lower free play position (Position 3) as you release the accelerator.
3) Shift into neutral (N).
4) Release the clutch pedal up to the upper free play position (Position 1) to reach an engine speed of 600 RPM.
5) Press the clutch pedal down again to the lower free play position (Position 3) and shift into second gear.
6) Gradually press down on the accelerator as you release the clutch pedal.

Use the same technique to shift into higher gears.

Important (high range): To shift into higher gears, you have to increase the engine speed by 300 RPM to reach 1,200 RPM. This increase will enable you to maintain an optimum torque of 900 RPM to shift into the next gear (after subtracting the 300 RPM necessary to perform the manoeuvre): 1,200 RPM – 300 RPM = 900 RPM.

Downshifting

You must also use the double-clutching technique when downshifting to prevent friction between the components of the non-synchromesh manual transmission and to guard against its mechanism wearing out prematurely. As with upshifting, you must first shift into neutral, with the difference that you then increase the engine speed before downshifting.

Downshifting technique

To downshift, you must slow down your vehicle with the service brake in order to reduce the engine's speed and stabilize its RPM. The engine's speed must be reduced to no faster than its maximum RPM when in neutral.

For example, based on the parameters in the example given above, you would downshift from fifth to fourth gear using the following procedure:

1) Slow your vehicle down until the gauge reads 900 RPM and push the clutch pedal down to the friction point (Position 2).
2) Make sure your engine speed (RPM) remains stable, then push the clutch pedal down to the lower free play position (Position 3) as you release the accelerator.
3) Shift into neutral (N).
4) Release the clutch pedal up to the upper free play position (Position 1).
5) Push down on the accelerator to increase the engine speed by 300 RPM until you reach 1,200 RPM (900 RPM + 300 RPM).
6) Release the accelerator as you push the clutch pedal down to the lower free play position (Position 3) and shift into fourth gear.
7) To complete your downshifting manoeuvre, release the clutch pedal.

The technique for downshifting further is the same. Mastering the double-clutching technique requires a great deal of time and you should practise it on flat terrain.

The Right RPM Is Important for Your Engine

Choosing the right RPM is important. An engine that does not turn over fast enough tends to lurch and this can damage your vehicle. An engine that turns over too fast, on the other hand, consumes fuel needlessly and provides no more power than it would at a lower RPM.

Heavy vehicle engines are identified by the type of fuel they use. Although some heavy vehicles have gasoline engines, most are equipped with diesel engines. Diesel engines are more powerful and fuel efficient, and have lower engine speeds than gasoline engines.

The arrival of electronics has considerably changed diesel engine performance. An electronic control unit regulates fuel injection and monitors multiple electronic sensors throughout the vehicle.

Recent innovations include controlling engine exhaust emissions, which contributes to improving the environment.

You should consult the manufacturer's manual for information on your engine's requirements and the recommended RPM ranges for changing gears.

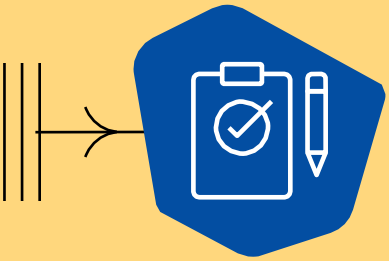
All engines have a top RPM. It is a good idea to change gears before the engine reaches that limit–a method also known as progressive shifting–if only to save on fuel. Referring to the tachometer is a more reliable way of determining when to change gears than listening to the sound of the engine or checking your speed.

PROGRESSIVE SHIFTING

When less efficient engines were still being used, drivers needed to rev their engines to their maximum RPM before changing gears. Professional drivers are now moving away from this method and using progressive shifting, which is better suited for modern engines.

With progressive shifting, you bring the engine speed almost up to minimum torque when shifting into the first three or four gears. For shifting through all higher gears, you need to gradually increase the RPM so that the engine turns over almost at or slightly above minimum torque. The advantage of progressive shifting is that it takes less time to get into the next gear and you can reach cruising speed more quickly.

Since revving the engine to its maximum RPM before changing gears means higher fuel consumption, progressive shifting translates into undeniable savings for all types of transportation. Whether you are hauling goods across the country or making local deliveries within a city, this method allows you to save on fuel because your engine remains at a moderate RPM and you reach cruising speed faster.



Exercise 4.1

Indicate whether each of the following statements is true or false.

Statements	True	False
1. For driving in snow or on a steep slope with an automatic transmission, you should shift to a higher gear.	◯	◯
2. Using the double-clutching technique does not require you to understand how to upshift and downshift.	◯	◯
3. The tachometer is a more reliable indicator of when to change gears than the sound of the engine.	◯	◯
4. The progressive shifting method consists of revving the engine to its maximum RPM before changing gears.	◯	◯
5. Diesel engines have higher engine speeds than gasoline engines.	◯	◯

The answer key is provided at the end of this guide.

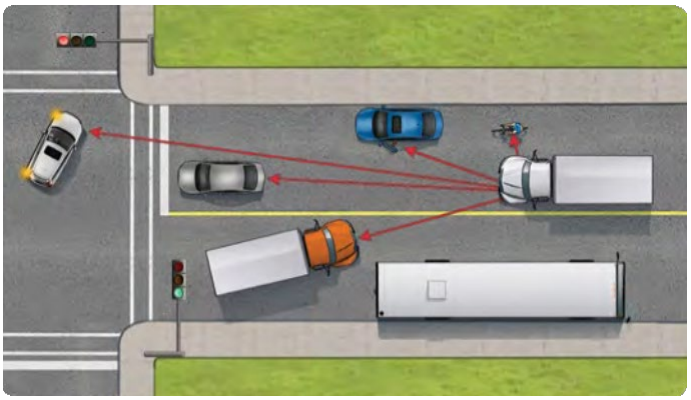
Keeping Your Eyes Open

Research has shown that driver distraction plays a role in the majority of accidents. To drive safely, you need to be constantly on the lookout so that you are always aware of everything that is happening in front of your vehicle and on either side. You should pay special attention to blind spots and to what you see in your side mirrors.

Looking well ahead

All drivers look ahead, but many of them do not look far enough ahead. Manoeuvres such as stopping or changing lanes take longer and require a greater distance in a heavy vehicle than in a car, so you need to look well ahead to be sure you have enough available space to execute each manoeuvre in a safe and controlled manner. Always looking far ahead protects you from being caught off guard and ensures that you maintain control over your vehicle at all times.

Looking far ahead requires you to scan the distance you will be covering in the next 12 to 15 seconds, while avoiding staring off into the distance. A time interval is a good way to estimate distance. The advantage of this method is that it works at all speeds. In cities and residential areas, this might be the equivalent of the distance between two intersections. On highways, where traffic moves faster, you need to look about one-half kilometre ahead. This will give you enough space to adjust your speed or change lanes if necessary.



Obviously, looking far ahead does not mean you can ignore what is happening closer to you. You should keep an eye on traffic flow and on vehicles that are about to merge with traffic, change lanes or make a turn.

By remaining observant and anticipating events well in advance, you can perform the necessary manoeuvres, adjust your speed and avoid having to brake abruptly.

Checking your side mirrors

You should know what is happening around your vehicle at all times. Use your side mirrors to check the traffic beside and behind you, and do so at regular intervals: every 10 or 12 seconds in normal conditions and more often in problem situations. This ensures that you will be able to safely change lanes, make turns or react to an unexpected hazard in a timely fashion.

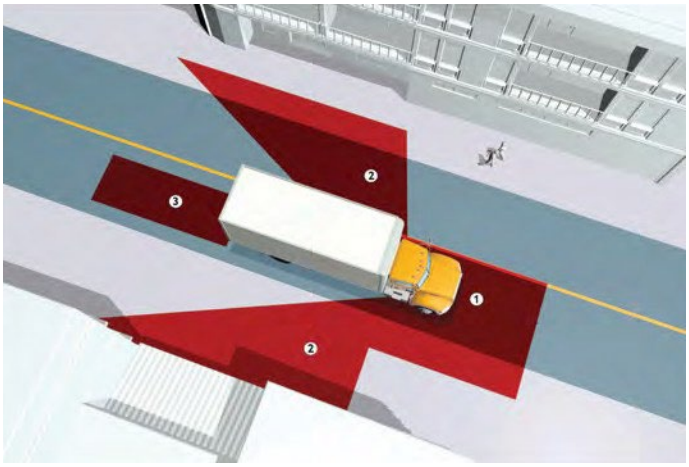
A quick glance

Since you cannot look ahead and in your side mirrors at the same time, you should take quick glances, shifting your eyes from the road up ahead to your side mirrors and back again. Avoid looking too long in the side mirrors because the situation ahead of you is constantly changing.

Understanding what you see

If one of your tires is overheating or on fire, the side mirrors also allow you to see this quickly. On some types of vehicles, they can be used to check on your semi-trailer and cargo to make sure it is well secured.

Most heavy vehicles are equipped with convex side mirrors that provide a wide-angle view, but they also make everything look smaller and farther away. Keep this in mind when changing directions.



Checking your blind spots

You should bear in mind that it is difficult to observe everything going on around you. Even with convex side mirrors, there are certain areas of the road that you cannot see, especially those in your blind spots. Be extra careful about other vehicles travelling close to you so as to avoid manoeuvres that might hinder other drivers.

To check your blind spots, look back at the areas behind you on your right and left that are not covered in your side mirrors. Make sure these blind spots are clear before you change lanes, make a turn, back up or start moving. Remember that your vehicle is bigger than those around you. This makes it all the more important for you to check your blind spots for the presence of smaller vehicles, cyclists or pedestrians.

Signalling your intentions

When you are driving, other drivers do not know what you are planning to do unless you tell them. This is why you must signal your intentions clearly and make sure other road users understand what you are planning to do. This will prevent many problems and help you avoid accidents. Once you are sure that you can make your move safely, signal your intentions. Here are some of the situations where you need to signal your intentions using your turn signal lights.

Turning

You must signal your intentions as soon as possible so that other drivers will have enough time to make allowance for the fact that you are about to make a turn and can avoid getting in your way. Activate your turn signal light as soon as you can be sure other drivers will not be at risk of mistaking your intentions, leave them on to make your intentions clear, and do not turn them off until you have completed the manoeuvre. Note that it is preferable to begin signalling your intentions before slowing down, unless slowing down will take some time, in which case having your turn signal light activated could cause confusion and lead to unsafe situations.

Before changing lanes

Signal your intention to change lanes well in advance. After making the usual checks and activating your turn signal light, begin to move gradually into the adjacent lane.

Slowing down and stopping

In cities and towns, you have to slow down or even stop your vehicle frequently. You must therefore pay close attention to other vehicles and avoid having to make abrupt moves. Your brake lights let other drivers know when your vehicle is slowing down or stopping. Avoid braking abruptly.

Allowing Yourself Enough Space

When driving, avoid following other vehicles too closely or taking a route where the roadway is not wide enough for your vehicle. Allow yourself enough space in front and to the sides to manoeuvre.

Space ahead

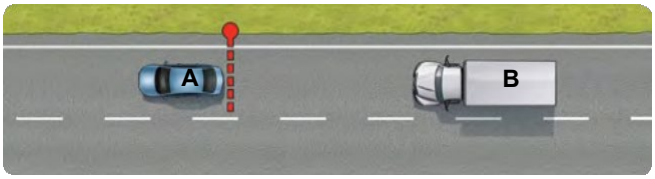
When you come to a stop behind another vehicle, you should try to leave enough space so that you can pull out around the vehicle if you have to, without having to back up. Likewise, you should always allow enough space in front of you when driving so that you can brake or stop easily if an unexpected hazard arises.

Counting the seconds is a good way of determining how much space to leave between your vehicle and the one ahead of you. To ensure that you are following at a safe distance, allow one second for every three metres in length of your vehicle, provided the pavement is dry. For example, if you are driving a heavy vehicle that is 12 m long, you should allow four seconds between you and the vehicle ahead. For a vehicle combination 18 m long, you should allow six seconds.

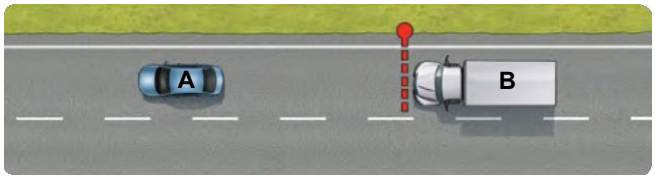
How to count the seconds

1) Choose a stationary object by the side of the road as a reference point, a little ahead of Vehicle A (you are Vehicle B).

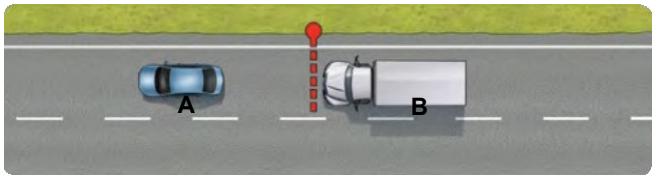
2) When the rear of Vehicle A passes the reference point, begin counting out the seconds like this: “one thousand and one, one thousand and two” and so on.



3) If you reach the reference point **after counting out the full number of seconds**, you are following at the right distance, under normal driving conditions.



However, if you reach the reference point **before you have finished counting** out the full number of seconds, you are following too closely.



You should increase the distance if you are travelling at speeds over 60 km/h or driving at night, and you should double the distance when driving on wet pavement, triple it when driving in snow, and quadruple it when driving on icy pavement.

Space behind

Most heavy vehicles are designed in such a way that it is practically impossible for you to see vehicles following close behind you. Furthermore, when you are forced to drive more slowly, particularly in cities and towns or in conditions of poor visibility, motorists tend to follow you closely.

Since there is no way you can prevent other drivers from tailgating you, you have to make allowance for their presence. Here is how to avoid problems:

- First, be careful and be ready at all times to respond to any change in the situation.
- Avoid making abrupt manoeuvres if you have to change lanes or turn.
- Signal your intentions ahead of time and before you brake, if the manoeuvre you are preparing to execute requires you to do so.
- Increase the distance between yourself and the vehicle ahead of you. Leave enough space so that another vehicle attempting to pass you can easily pull back over into your lane ahead of you. Do not use your brake lights to warn the other driver not to follow you too closely.

Space to the sides

A heavy vehicle occupies almost the full width of a traffic lane. To drive safely, maintain your vehicle in the centre of the lane and avoid straying into other lanes. Look well ahead of you to the centre of the lane in which you are driving: this will help you to maintain your vehicle in the centre of your lane.

Whenever possible, drive defensively and adapt your driving to the road conditions and traffic, while making sure that other drivers can see you.

Strong winds or blowing snow can make it difficult for you to stay in your lane without wandering into an adjacent lane or onto the shoulder of the road. The way your vehicle reacts to crosswinds varies, depending on whether or not you are carrying a load (all the more so if the road is covered with snow or ice), particularly when your vehicle is emerging from a tunnel or travelling under an overpass. In high winds, slow down.

Also keep an eye out for signs indicating that you are approaching an area of high winds or blowing snow.

Space overhead

To be a good driver, you must be aware of the size of the vehicle you are driving—especially the height of the vehicle and its load—so that you can avoid striking overhead structures such as bridges or overpasses.

The following suggestions will help you avoid this danger:

- Do not automatically assume that the heights posted at bridges and overpasses are correct. Repaved roads, ice or packed snow can reduce clearance. If you are not certain that you have enough overhead space when approaching a bridge or overpass, stop and check to make sure.

- The weight of your load can affect the height of your vehicle. For example, an empty trailer rides higher than a loaded one.
- On some roads your vehicle may tilt, causing you problems clearing roadside objects such as trees or road signs. If there is an actual risk of hitting them, drive your vehicle a little closer to the centre of your lane, but be very careful not to trespass into the adjacent lane. Remember that there might be other vehicles approaching you from ahead or behind.

- Before backing up, make sure you have enough room. Ice on electrical wires, branches or other overhanging objects can reduce your clearance and block your way.

Negotiating a Curve

Curves come in all shapes and sizes. Even if there is a sign indicating the configuration of the curve you are approaching, you should visually check, as far in advance as possible, to see how sharp the curve is. This means looking well ahead so that you can anticipate different scenarios and plan the right moves. Even though you cannot alter the configuration of the curve or the condition of the pavement, you can control your vehicle's speed. In fact, your speed is the crucial factor to consider when negotiating a curve.

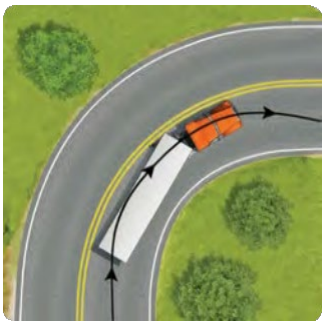
In order to slow down, it may be enough to remove your foot from the accelerator or downshift. If you have to brake, though, make sure that you do so before you go into the curve, while your vehicle is still travelling in a straight line. It is important to choose a gear that will enable you to accelerate slightly once you are in the curve in order to keep your vehicle stable.

Because most heavy vehicles have a high centre of gravity, the driver must demonstrate a high degree of skill when negotiating a curve. Going into a curve at high speed could cause you to lose control of your vehicle, swerve or even overturn.

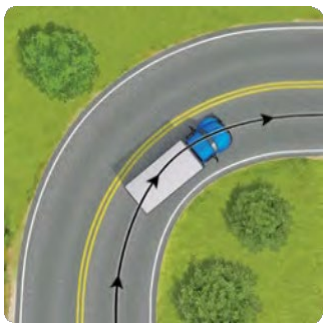
Avoid braking or downshifting in curves. Instead, you should make sure that you are in the right gear before entering the curve.

Once you are in the curve, keep an eye on oncoming vehicles to make sure they are not straying too close to the centre line. Before entering a curve turning to the right, edge your vehicle close to the centre line or the far-left side of the lane you are driving in. Hold this position until you exit the curve, then move back to the middle of your lane.

Negotiating a right curve with a tractor semi-trailer

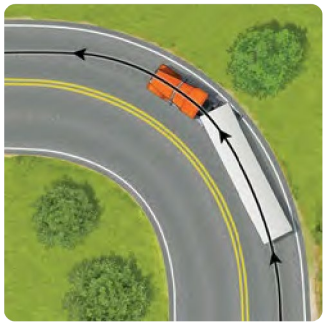


Negotiating a right curve with a straight-body truck or a bus

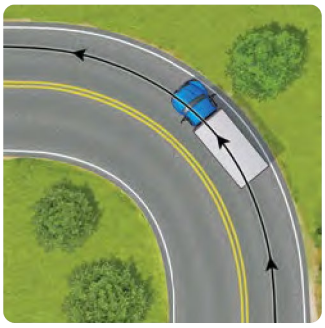


Before entering a curve turning to the left, edge your vehicle over to the right side of the lane you are driving in. Hold this position until you exit the curve, then move back to the middle of your lane.

Negotiating a left curve with a tractor semi-trailer



Negotiating a left curve with a straight-body truck or a bus



As you are exiting the curve, accelerate gradually to resume your normal cruising speed.

Turning at an intersection

When turning at an intersection there is always the risk of straying into other lanes or onto the median, striking obstacles or causing an accident. Be very careful!.

The basics

To make a safe turn, follow the steps outlined below:

As you are approaching the intersection

- Make sure you are in the proper lane for turning.
- Gradually slow down and adjust your speed to avoid having to brake or downshift while you are turning.
- Check your side mirrors and blind spots, then signal your intentions.
- Shift into the right gear before turning to avoid having to shift gears during the turn, if your vehicle has a manual transmission.
- Check to make sure you have enough space, considering the size of your vehicle and any obstacles.

As you are turning

› Check your surroundings throughout the manoeuvre.
› Begin your turn as soon as your vehicle enters the intersection.
› Accelerate gently as you are coming out of the turn.

Whether you are turning right or left, this manoeuvre requires you to exercise a high level of skill and make continuous visual checks.

When turning at an intersection, you must take into account the fact that your rear wheels trace a shorter path than your front wheels. To compensate for this, you should steer the front of your vehicle so as to use all of the available space. Sometimes you may even have to encroach on the lane to your left or right with your front wheels in order to complete the manoeuvre (see illustrations), although this is prohibited by law in some situations. If you have to do this, make sure there is no risk of your rear wheels straying onto the sidewalk, onto the shoulder or into another lane. Keep the space between your vehicle and the side of the road as small as possible to prevent pedestrians or other vehicles from venturing into this space.

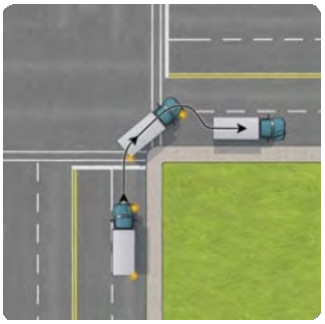
Right turns

Signal your intentions and then make your turn as follows:

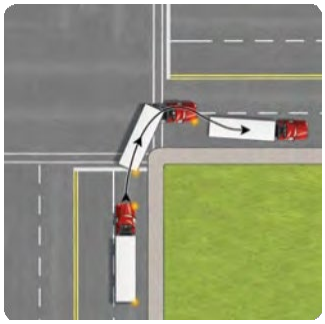
1) Keep your vehicle in the right lane and be on the lookout for other road users (vehicles, cyclists, motorcyclists, pedestrians, etc.) that might venture into the space between the side of the road and your vehicle.
2) After checking left, right and then left again to make sure that the way is clear, start making your turn holding the front end of your vehicle close to the dividing line on the left side of the lane you are entering. Even though it is prohibited by law to do so, road configuration and vehicle size sometimes leave you no other choice but to encroach slightly on the next lane. If you have to do this, make sure the way is clear and remain alert to vehicles that might appear unexpectedly.
3) Continue straight ahead, close to the dividing line, and make sure your rear wheels do not stray onto the sidewalk or shoulder.
4) Steer your vehicle back to the centre of the lane.

Limit the space between your vehicle and the side of the road as much as possible, and be alert throughout the manoeuvre to prevent pedestrians or other vehicles from venturing into this space.

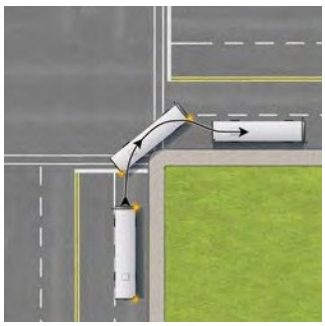
Turning right with a straight-body truck



Turning right with a tractor semi-trailer



Turning right with a bus

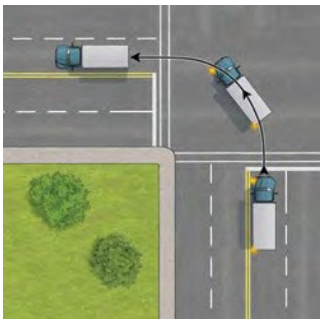


Left turns

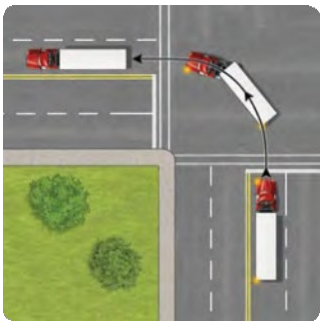
Signal your intentions and then make your turn as follows:

1) Steer your vehicle into the appropriate lane, edging over to the right-hand side of the lane, if necessary.
2) After checking left, right and then left again to make sure that the way is clear, steer your vehicle so that its front end is close to the dividing line of the other road and edge over to the right side of the lane you are entering. If you do not have enough space, it may sometimes be necessary to encroach slightly on the other right-hand lane after making sure the way is clear. Be on the lookout for other road users (vehicles, cyclists, pedestrians, etc.) that might appear unexpectedly.
3) Continue straight ahead, close to the right-hand dividing line, until you have almost completed your turn, making sure that your rear wheels do not cross over the centre line.
4) Steer your vehicle back to the centre of the lane.

Turning left with a straight-body truck

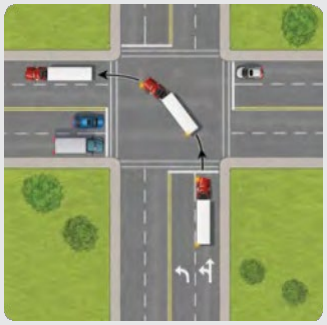


Turning left with a tractor semi-trailer



With certain configurations of heavy vehicles, you may have to encroach on the far right-hand lane to complete your left turn. By doing this, you can avoid having to make successive lane changes after turning. If you have to do this, however, you must be very careful, because if there is another vehicle in a parallel lane turning left at the same time as you or coming from the opposite direction and turning right, that other vehicle has the right of way.

If there are two lanes from which left-hand turns are permitted, you should make your turn from the outside or far right lane so as to avoid encroaching upon the adjacent lane. Another advantage of doing this is that you can be sure there will be no other vehicle to your right (in which case, you might not be able to see it) attempting to turn left at the same time as you. But be very careful when performing this manoeuvre, since it may surprise any driver in the other left turn lane (to your left) who is also turning left.



Backing Up

Things to check when backing up

Backing up causes various problems for drivers of heavy vehicles. It is usually impossible, using just your side mirrors, to see what is directly behind your vehicle, particularly when backing into a small space. Although it is preferable to back up as seldom as possible when driving a heavy vehicle, this is a manoeuvre that you will be required to perform fairly often—when approaching a loading dock, for example. Obey the following rules and you will be able to back up safely.

Before backing up

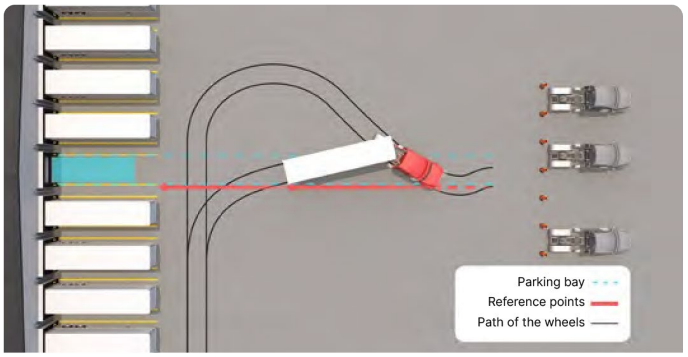
Before you begin backing up, it is essential for you to take a moment to look at the layout of the surrounding area. If necessary, get out of your vehicle to assess the situation: check the condition of the road surface, note the location of any stationary objects, and anticipate any potential pedestrian and vehicle traffic that might hinder your manoeuvre.

Check carefully for any obstacles overhead or to the sides of the vehicle that might get in your way. You can unbuckle your seat belt if need be. The *Highway Safety Code* does not require you to have your seat belt fastened when backing up. You should also eliminate all sources of distraction like the radio or music and roll down your window to listen to your surroundings.

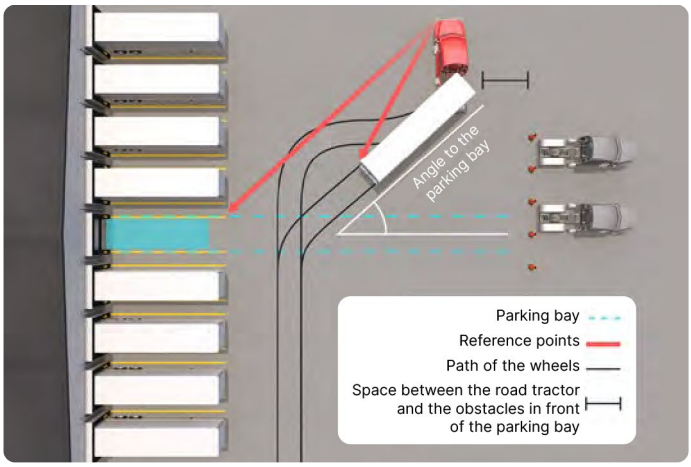
Proper positioning to make backing up easier

After locating your parking spot and identifying any obstacles, you must assess how much space is available for backing up.

If you have enough space, it is best to simply back up in a straight line. To do so, you need to pull forward and turn so as to position the tractor and semi-trailer in line with the parking bay.



When space is limited, you need to position the semi-trailer at an angle to the parking bay before starting to back up. You must make sure the road tractor can clear any obstacles that may be in front of the parking bay.



This technique allows you to simultaneously back up and pivot the trailer. Assessing space is explained in Chapter 7.

Backing up slowly

Once you have finished checking the layout, begin backing up immediately, before there is any change to the situation as you just observed it.

Backing up slowly is the key to completing the manoeuvre safely and successfully. By taking it slow, you will find it easier to correct steering errors, estimate distances and stop the vehicle if need be. Steering errors should be corrected immediately.

Visibility of the trailer or semi-trailer while backing up

When backing up after dark in such a way that you obstruct the lane reserved for oncoming traffic, your trailer or semi-trailer may be harder to see for drivers coming from the opposite direction.

Here are three recommendations to increase your vehicle's visibility during this manoeuvre:

1) Use your hazard lights.
2) Do not turn on your headlights (high beams)—they could blind other drivers.
3) When possible, plan to arrive on the same side as the loading dock.

Backing up toward the driver's side

You should back up by steering the rear of the vehicle toward the driver's side (to the left) if at all possible because this allows you to see a part of the area behind the vehicle. Look through the left side window and use the left side mirror if the angle between the tractor and the trailer allows you to do so. With a bus or a straight- body truck, you can mainly use the left side mirror, but you must also regularly check the right side mirror and the right side window to complete the manoeuvre safely. By using your side mirrors properly, you can see whether you are steering your vehicle in the right direction and backing up safely.

Having a helper guide you

It is always better to have a helper guide you whenever you are backing up, especially when backing up toward the right. Choose someone reliable and make sure the person understands what to do and what signals to use. Your helper should keep an eye on the space available behind and on either side of your vehicle, and should also help you correct your vehicle's position where necessary.

You must be able to see your helper at all times. As a rule, when you are backing up toward the left, your helper should stand behind your vehicle off to the left side; when you are backing up to the right, they should stand behind the vehicle off to the right side. This way, your helper can maintain visual contact with you.

How to back up

Backing up a heavy vehicle toward the right or the left requires the driver to pick out a pair of visual reference points and then steer backward using these two points.

To perform this manoeuvre, you must maintain visual contact with these reference points as you line them up together. These two points are:

› the rear corner of your vehicle on the side toward which you are backing;
› the farthest rear edge of the loading dock or parking space toward which you are backing your vehicle.

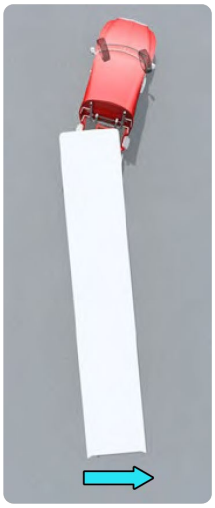
To back up toward the left or right with a bus or straight-body truck, you must turn the steering wheel toward the side to which you are steering the rear of the vehicle until both reference points are lined up side by side: toward the right if backing to the right and toward the left if backing to the left.

To back up toward the right or left with semi-trailer hitched to a tractor, the manoeuvre is different. While maintaining visual contact with the two reference points, turn the steering wheel in the opposite direction from that toward which you want to steer the semi-trailer.

Backing up toward the right

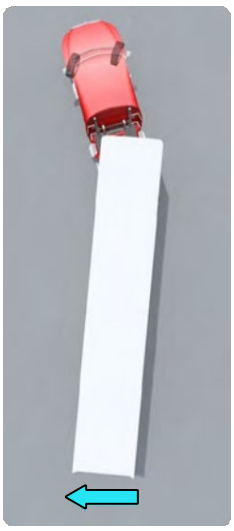
1) Turn the steering wheel to the left so that the semi-trailer backs up toward the right, while aiming the semi-trailer so as to line up the two reference points.

2) Turn the steering wheel to the right so that the tractor also backs up toward the right, and continue backing up until the two reference points are lined up side by side.



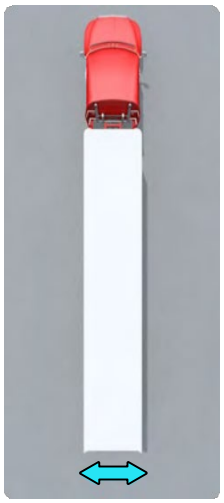
Backing up toward the left

1) Turn the steering wheel to the right so that the semi-trailer backs up toward the left, while aiming the semi-trailer so as to line up the two reference points.
2) Turn the steering wheel to the left so that your tractor also backs up toward the left, and continue backing up until the two reference points are lined up side by side.



Backing up in a straight line

The same rules apply when you want to back your semi-trailer up in a straight line. If the semi-trailer begins to veer off to the left or the right, turn the steering wheel in that direction so as to realign the semi-trailer. In some cases, the semi-trailer may veer so far out of line that you will have to correct the alignment by stopping your vehicle, pulling forward, and then beginning to back up again.



Changing Lanes

1) Before you decide to change lanes, make sure that the manoeuvre is allowed and that it is safe to do so.
2) Check to see how heavy the traffic is and how fast the other vehicles are moving; you must also check your side mirrors and your blind spots to see if there are any vehicles, cyclists or pedestrians travelling beside you or about to overtake you.
3) Activate your turn signal light to indicate you are about to change lanes.
4) Check your side mirrors once more, then check your blind spots to make sure it is still possible for you to change lanes and to determine, among other things, whether the distance between your vehicle and other vehicles has changed.

Once you have completed these steps, steer your vehicle slowly but steadily into the other lane. This will signal to other drivers that you are in the process of changing lanes and they will be able to adjust to your movements.

Passing

The things you need to check before passing another vehicle and the procedure for doing so are the same as for changing lanes. Basically, passing means changing lanes twice: first into the left lane, then back into the right lane. Do not forget to turn off your turn signal lights after each lane change.

Remember that you need a greater distance to pass because the heavy vehicle you are driving is considerably longer and heavier than an automobile.

Avoid using your horn when passing, unless absolutely necessary. Using your horn can startle other drivers, with unpredictable results. If you are driving at night and you need to pass, you can flick back and forth from high to low beams to signal your presence to the other driver. Before you make any move, be sure that the other road users understand what you are preparing to do: do not just assume that they have understood.

Not signalling others to pass you

Some people mistakenly think they are being helpful by signalling to other road users when to pass. However, there may be people or vehicles that they are unable to see. Also, drivers who pass when someone else is signalling them to go ahead may be affected by a false sense of confidence and become less alert for unexpected moves by others. You should concentrate on signalling your own intentions instead of signalling to others what to do.

Driving Uphill

When driving up a hill, you must make sure you can remain in control of your vehicle and deal with unexpected hazards.

Your vehicle may already be travelling fast enough to go up a gentle slope, without requiring you to downshift if your vehicle is equipped with a manual transmission. You merely have to accelerate slightly to get enough power from the engine to keep your vehicle moving at a constant speed.

On a steeper slope, however, you must use your transmission properly to obtain the best performance from your engine. This means that as you go up a slope, you must be able judge the proper moment for downshifting to achieve maximum efficiency. Properly timing your gear changes is especially important when you are carrying a heavy load. Mastery of proper technique is essential.

If you need to start your vehicle on an uphill slope, it helps to use your service brake to keep your vehicle from coasting backwards. When you are ready to move forward, ease off the clutch until you feel the friction point, release the service brake pedal, then gradually push down on the accelerator.

Traction aids

Inter-axle differential locks and inner axle differential locks

Inter-axle differential locks (offered as an option by the manufacturer)

As indicated in Chapter 2, some trucks with two drive axles (dual axles) are equipped with an inter-axle differential lock. The inter-axle differential lock has a pneumatic locking device controlled by the driver. When you engage the locking device, both drive axles rotate at the same speed for better performance under certain difficult conditions.

In poor traction conditions, such as in winter, this device ensures that at least one wheel on each drive axle will grip the road surface.

Inner axle differential locks (offered as an option by the manufacturer)

Depending on the manufacturer, some drive axles can be locked separately at either 75% or 100% of their capacity. However, it is important to keep the vehicle's speed at 25 km/h or less to safely take advantage of these traction aids.

Lock activation procedure

The application and operation of drive axle locks can vary from one vehicle to another. It is important to refer to the method prescribed by the vehicle's manufacturer. Here is an example of the procedure.:

Procedure to activate the inter-axle differential lock:

- Maintain a constant speed while driving in a straight line.
- Make sure none of the drive wheels are sliding around.
- Switch the lock control to ON or LOCK.
- Release the accelerator momentarily and slowly press back on it again.

As you are carrying out this procedure, in certain cases you can use the clutch pedal to eliminate engine torque being applied to the mechanical components in order to avoid damaging them. This system may be used at any speed.

Procedure to lock drive axles at 75% or 100% of their capacity

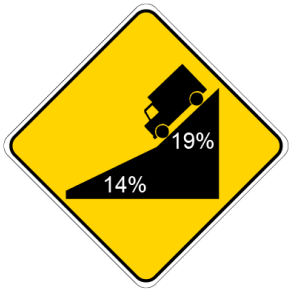
The procedure is the same as the one described above, but should only be carried out while travelling at speeds of 25 km/h or less.

You should only use these systems when driving on a straight road. In a curve, locked differentials could cause you to swerve off the road.

In addition, neither of these systems are designed to be used over long distances. They should only be used in situations you consider risky or to get out of a difficult situation.

Driving Downhill

Checking road signs and signals



Signs are usually posted to warn drivers of any exceptionally steep slope in the road up ahead. You should pay special attention to the percentage on the sign because the higher the percentage, the steeper the slope. If the slope extends for more than one kilometre, that fact is indicated on the sign.

Check your brakes before starting down a hill, no matter what kind of brake system you have

This recommendation is of the utmost importance, no matter how steep the slope you are about to drive down. For example, the sign illustrated above indicates that the driver is approaching a slope of 150 m for every kilometre over a distance of at least 3 km. The sign above it indicates that the driver is approaching two different slopes, one immediately following the other and each with a different gradient.

Mandatory check

In some places, there are special signs requiring you to pull over at a specific spot and check your brakes. The signs indicate the distance to the brake check area. When you arrive there, you will see the VÉRIFICATION[15] sign indicating that you must come to a full stop before the Stop sign.

If it has been a while since the last circle check, it would be wise to repeat the brake check procedure required for the circle check, as explained in Chapter 5.

15 The VÉRIFICATION sign means that you must stop for a brake check if the vehicle you are driving is a heavy vehicle or combination of heavy vehicles with a total loaded mass of 3,000 kg or more.

Brake Inspection

You should make sure your brakes are in good working order before you start out on each trip. The method for checking your brake system is described in Chapter 6.

Keep an eye on your pressure gauges and lights while you are driving and be alert for anything that seems abnormal when you apply your brakes.

You may also be required to check your brakes in designated brake check areas when driving through a hilly or mountainous region, for example. These areas are indicated by a VÉRIFICATION sign. When you see this sign, you must pull over into the designated brake check area, park your vehicle at the stop sign and check your brakes.

Driving down a gentle slope

On a gentle slope, letting up slightly on the accelerator may be all you need to do to control your speed.

Driving down a steep slope

Before driving down a steep slope, however, you must make sure your brakes are working properly by pushing down on the brake pedal. You must then slow down and adjust your speed so that you can drive down the hill at a safe speed. Once you have reached that speed, before starting down the slope, select the appropriate gear. Avoid changing gears as you are going down the slope. If the slope is very steep, we also suggest that you use engine compression and retarders (if your vehicle is equipped with them).

Using your brakes when driving down a steep slope

If you apply your brakes repeatedly or over an extended period of time while driving down a long slope, they may overheat and fail to work properly when you need them. This is why it is so important, before you start down the hill, to shift into the right gear to maintain control of your vehicle all the way down.

Despite this, you may still need to use your brakes when going down a long slope. If so, here is how to apply the brakes:

1) Push down hard enough on the brake pedal to actually feel the vehicle slowing down. If your vehicle is equipped with air brakes, avoid pumping the brakes because this will quickly reduce the air pressure in the reservoirs.
2) Once you have reduced your speed to about 10 km/h below the speed considered “safe,” take your foot off the brakes.
3) When the vehicle has once again reached the speed you consider safe, repeat steps 1 and 2 so as to maintain control of your speed.

For example, let’s say that you are going down a hill where the safe speed is 50 km/h. Your speedometer shows 55 km/h. Since the safe speed is 50 km/h, you must use the brake pedal to reduce your speed to 40 km/h. Once you have reached that speed, take your foot off the brakes. When your speed has climbed back up to 50 km/h, reduce your speed once again to 40 km/h to keep your vehicle’s speed under control. Repeat this procedure as many times as you need until you have reached the bottom of the hill.

Using your transmission and engine compression to slow down when going downhill

Before driving down a steep slope, you should shift into a gear that allows you to maintain control of your vehicle’s speed. Manufacturers' manuals state that you get the greatest braking effect from the engine in first gear and that the general practice is to shift into first before starting down a steep slope.
You should stay in this gear all the way down. By using the lowest gear appropriate for the slope, engine compression helps slow the vehicle down and control its speed. Compression is effective whether your vehicle is equipped with a standard or automated manual transmission.

Supplemental Brakes

In certain situations, particularly when your vehicle is loaded, you can use your supplemental brakes to help you maintain the desired speed without overusing your service brakes. If your vehicle is equipped with a supplemental brake, you should make sure it is working properly before you start downhill. All you need to do is activate the switch and release the accelerator.

You should be aware that supplemental brakes are most fully effective when applied at the point when the engine is turning at its maximum RPM for a given gear.

Once you reach the bottom of the hill, increase your speed and shift to the appropriate gear.

You need to be careful though when using the engine brakes on slippery roads, especially with a partially loaded vehicle, because the engine brakes may stop the drive wheels and cause the vehicle to skid.

Retarders are quite noisy and may be prohibited in some municipalities. You should use them sparingly.

Braking Distance

Good drivers should be able to control their speed at all times. The faster you drive, the less time you have to react and the greater the braking distance. Road conditions can change very quickly when you are driving and the distance you travel in only one second can make the difference between stopping safely or having an accident.

TO AVOID ABRUPT STOPS:

- Adjust your vehicle's speed to traffic conditions and maintain a safe distance between you and the vehicle up ahead (counting the seconds as described above).
- Look up ahead, to the sides and in the side mirrors so that you are always aware of traffic conditions.
- Anticipate where and when you will have to stop.

How to Bring Your Vehicle to a Stop

You should use your heavy vehicle's gears not only when speeding up but also for slowing down.

This way, engine compression helps you slow down your vehicle. Furthermore, if you should need to speed up again, you will already be in the right gear to do so.

To slow down or stop quickly, you should use your transmission (by downshifting) and brakes in combination. You can use your service brakes or, where permitted, your supplemental brake system. Downshifting and braking at the same time puts less of a strain on your brakes. Once you have come to a stop, it is a good idea to shift to neutral if you are going to be stopped for a while.

Whether you drive a tractor semi-trailer, bus or straight-body truck, it is important to make sure you have enough space to come to a stop. This will keep your passengers safe and comfortable or prevent damage to cargo.

By following these recommendations, you can avoid having to make abrupt stops. When you brake abruptly with a heavy vehicle, the vehicle's weight produces a strong forward momentum that can cause you to lose control. Depending on road conditions, this can send the vehicle into a skid and cause an accident resulting in severe damage.

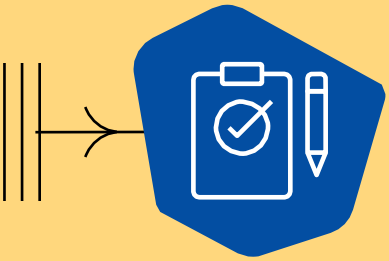
Responsible parking practices

When you park your vehicle, take the opportunity to check a few things. If you are hauling dangerous or valuable goods, choose a location that is safe and well lit.

Walk around the vehicle and listen for sounds, such as hissing air leaks. Odors or smoke may also indicate a defect, especially around the brakes. Make sure that the tires are in good condition and properly inflated, and that the cargo is firmly secured.

Make sure the trailer is properly hitched and check all the lights on the vehicle.

Make sure that all cab accessories are off and straighten out the wheels and the trailer. Roll up the windows, lock any openings, turn off the ignition and disconnect the battery (if the vehicle is equipped with a circuit breaker).



Exercise 4.2

Indicate whether each of the following statements is true or false.

Statements	True	False
1. Looking far ahead of you is really only essential when driving on a limited-access highway.	◯	◯
2. You are driving a heavy vehicle 18 m long in normal conditions. To maintain a safe following distance, you need to count out an interval of six seconds between you and the vehicle you are following.	◯	◯
3. Before starting down a hill where a road sign shows a slope with a 10% gradient, you should reduce your vehicle's speed by 10%.	◯	◯
4. You should avoid braking when going around a curve to avoid the risk of skidding.	◯	◯
5. To use air brakes effectively, you should press and release the brake pedal several times rapidly.	◯	◯
6. A right turn is the easiest manoeuvre to perform when driving a heavy vehicle.	◯	◯

The answer key is provided at the end of this guide.

Driving a Double Road Train

This chapter presents the information you need to operate a double road train, which is a combination of vehicles consisting of two semi-trailers hitched to a road tractor.

Some double road trains exceed the maximum length of 25 m prescribed for such vehicles in the *Vehicle Load and Size Limits Regulation*. They are called long combination vehicles (LCVs).

To be authorized to operate on the road, LCVs must have certain characteristics and comply with specific conditions.

To drive these types of heavy vehicles, you must hold a Class 1 driver's licence with the appropriate endorsements (M, F, T) depending on the vehicle's characteristics.

Generally speaking, if you have mastered the driving techniques for tractor semi-trailers, you already have the skills you need to drive a double road train. When driving one of these vehicle combinations, however, you have to pay attention to the following:

- Each vehicle combination has its own special characteristics and its own way of reacting in different weather conditions. Getting a double road train to begin moving forward on slippery pavement may be difficult because with this type of vehicle combination, the wheels are more likely to begin spinning in place. A double road train is also more likely to go into a skid when travelling on a level road or up a slope, when the road is covered with snow, or even when the pavement is just wet.
- You must therefore be aware of how handling a double road train differs from handling other types of heavy vehicles.
- You need to be familiar with how a double road train handles because, sooner or later, you will find yourself facing an unexpected hazard. You will have to be able to react immediately and know what to do.
- The first rule to follow at all times is to drive safely and defensively. This will enable you to anticipate and avoid hazardous situations before they arise. Any delay in correcting a situation that threatens your safety can result in an accident.

HOW TO DRIVE DEFENSIVELY

- Obey the speed limit. Never drive faster than the posted limit.
- Adjust your speed according to traffic and weather conditions.
- Obey all road signs, pavement markings and traffic signals, as well as the traffic rules set out in the *Highway Safety Code*.
- Pay constant attention to how your vehicle is reacting and to how your driving environment is changing.
- Perform your driving manoeuvres smoothly.
- Look far ahead so that you can anticipate any problems that might arise. This will help you to avoid having to brake frequently or change gears or directions abruptly to avoid a collision.
- Apply the brakes gradually to prevent your wheels from locking up and to minimize the risk of jackknifing. This type of accident occurs when the angle of lateral rotation between a road tractor and a semi-trailer exceeds 90°.
- Be courteous to other road users: this makes the road a safer place for you and for others.
- Plan your route so as to minimize the distance you will have to travel.
- Watch out for the warning signs of fatigue.
- Check your side mirrors regularly to make sure the second semi-trailer is not weaving from side to side. This will help prevent losing control of your vehicle.

Driving in a straight line and the risk of fishtailing

Various factors, such as bumpy roads, high winds or abrupt turns of the steering wheel, can cause a second semi-trailer to weave back and forth. This type of motion, referred to as "fishtailing," is a typical problem for drivers of double road trains. When you change lanes, for example, the second semi-trailer may begin to swing widely from side to side. The fishtailing can gradually increase to the point where the second semi-trailer overturns.

It may be difficult for you to immediately detect when your semi-trailer is fishtailing, and this delay can reduce your available reaction time.

You can maintain control of your vehicle, however, by staying focused on what is happening on the road and by checking your side mirrors regularly.

Braking

In theory, the braking capacity of a double road train is greater than that of a tractor semi-trailer. This increased braking capacity is due primarily to the greater number of wheels, which thereby enhances the effect of the brake system. In practice, however, the more axles and articulations a combination vehicle has, the harder it is to brake evenly, i.e. to stop the tractor and the semi-trailers at the same time and with the same braking power.

Since maximum braking efficiency is important throughout a trip, good drivers avoid braking abruptly or applying the brakes over an extended length of time. To do this, you must drive safely and defensively.

To avoid having to brake frequently, you should be constantly monitoring the movement of traffic and adjusting your speed accordingly. You should also leave enough space between you and the vehicle in front of you.

By using the method explained below, you can determine the ideal interval in seconds that should separate you from the vehicle ahead of you, no matter how light or heavy the traffic or what kind of road you are travelling on: city, country, etc. To do this, professional drivers usually divide the length (in metres) of their vehicle by three and count one second for every three metres. For example, if you are driving a 24 m double road train, you should maintain a space corresponding to an interval of eight seconds between your vehicle and the one in front of you (24 / 3 = 8).

HOW TO STAY A SAFE DISTANCE FROM OTHER VEHICLES

- Choose a stationary object by the roadside, such as a road sign, as a point of reference.
- When the vehicle ahead of you reaches that point, start counting out the seconds like this: “one thousand and one,” “one thousand and two” and so on until you reach “one thousand and eight” (assuming your vehicle is a 25-m double road train).
- If you reach the reference point before you get to “one thousand and eight,” this means that you are following the vehicle ahead of you too closely.
- Start over again and try to maintain the proper distance between your own vehicle and the vehicle ahead of you. If, despite these precautions, you are forced to brake abruptly, the most important thing is to avoid causing your wheels to lock up. To make sure this does not happen, your brake system must be in good working order and the weight of the load must be properly distributed over the axles.

It is important to remember the following points:

- If the front wheels of your tractor lock up, you cannot steer properly.
- If the back wheels of your tractor lock up, your vehicle could jackknife.
- If the wheels of the second semi-trailer lock up, it may begin fishtailing.

Each time you brake, you should check in your side mirrors to see how the semi-trailers react.

Be careful when using your retarders because they act only on your drive wheels. On slippery roads, some types of retarders can cause your drive wheels to lock up and cause your vehicle to jackknife.

Most tractors and semi-trailers are equipped with an anti-lock brake system (ABS), which ensures greater vehicle stability, better steering control and, in general, shorter braking distances. But you must remain alert and be ready to take control if an unexpected hazard arises.

Negotiating a curve and turning at an intersection

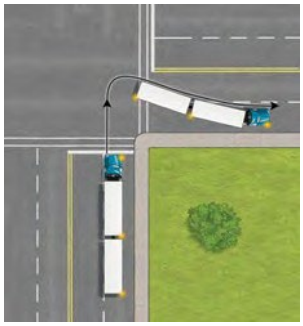
When turning at an intersection or negotiating a curve, you must evaluate how much space your tractor and semi-trailers will need. You must take into account the fact that the rear axles of the second semi-trailer tend to cross over into the other lane as you are turning.

Just how far they cross over into the other lane depends on your vehicle's total length and the adjustment of the fifth wheel and the axles. It is easier to make turns with a B-double road train because this type of vehicle combination usually has a shorter wheelbase. An A-double road train, on the other hand, has three pivot axes, so its wheelbase is longer and it is harder to turn.

Basically, you have to coordinate speed and direction in order to steer your vehicle exactly where you want it to go when making a turn.

Right turns

For the driver of a heavy vehicle, turning right is the hardest manoeuvre to execute due to the risk of colliding with vehicles travelling in the adjacent lane. Be extra cautious and clearly visualize the turn you are preparing to make. Here are the steps to follow:



1) Keep your vehicle in the right lane and be on the lookout to prevent other road users (vehicles, cyclists, motorcyclists, pedestrians, etc.) from venturing into the space between the side of the road and your vehicle.

2) After looking left, right and then left again to make sure that the way is clear, start making your turn holding the front end of your vehicle close to the dividing line on the left side of the lane you want to enter. Even though it is prohibited by law to do so, road configuration and vehicle size sometimes leave you no other choice but to cross over slightly into the next lane. If you do this, make sure the way is clear and remain alert to vehicles that might appear unexpectedly.

3) Continue straight ahead, close to the dividing line, and make sure your rear wheels do not cross over the sidewalk or shoulder.

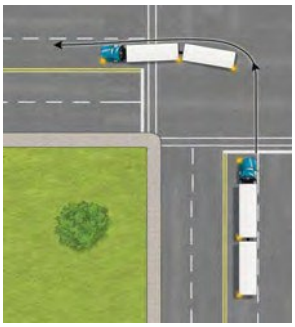
4) Steer your vehicle back to the centre of the lane.

5) Stay in the left lane after completing the turn if you expect to be making a left turn up ahead. If you are not planning to make a left turn, edge your vehicle over into the right lane, as shown in the illustration.

Limit the space between your vehicle and the side of the road as much as possible, and remain alert throughout the manoeuvre to prevent other road users from venturing into this space.

Left turns

To make a left turn safely, in general you must:



1) Steer your vehicle into the left lane.

2) After looking left and right to make sure that the way is clear, steer your vehicle so that its front end is close to the dividing line of the other road and edge over to the right side of the lane you are entering.

3) If you do not have enough space, it is sometimes necessary to cross over slightly into the other right-hand lane after making sure the way is clear.

4) Continue straight ahead, close to the right-hand dividing line, until you have almost completed your turn, making sure that your rear wheels do not cross over the centre line.

5) Steer your vehicle back to the centre of the lane.

Due to the configuration of your double road train, you may have to cross over into the far right-hand lane to complete your left turn so as to avoid having to make successive lane changes, as explained in Chapter 5. If you do this, however, you must be very careful, because if there is another vehicle in a parallel lane turning left at the same time as you or coming from the opposite direction and turning right, the other vehicle has the right of way.

Passing and avoiding obstacles

Your second semi-trailer is at risk of overturning if you steer sharply to one side to avoid an obstacle.

You can take steps to prevent this from occurring if you choose the proper equipment and make certain adjustments. By using hard tires and by properly adjusting the suspension, axle placement and fifth wheel position, you can reduce the risk of overturning.

The way you drive is also important. You can reduce the risk of overturning by:

- scanning the road up ahead;
- reducing your speed;
- changing lanes as soon as you detect any unexpected hazard;
- avoiding turning the steering wheel any more than necessary: the more you turn the steering wheel, the greater the risk of overturning or jackknifing;
- avoiding turning the steering wheel sharply when manoeuvring around an obstacle.

Being passed by another vehicle

The longer a vehicle is, the greater the time and distance required to overtake it. However, other road users preparing to pass a double road train are usually unaware of how long the vehicle is and how its size affects its braking time. As a result, they may misjudge the time needed to pass a double road train. And they may not realize the danger of pulling back over into the right lane too quickly after passing a double road train without allowing enough space between the two vehicles.

To make it easier for another road user to overtake your double road train and pass you, reduce your speed and stay in the right-hand lane, but do not edge over onto the shoulder. If the road is wet, stay out of any ruts in the pavement to avoid splashing water onto the vehicles passing you. Remain vigilant at all times.

Passing another vehicle

Here are a few tips to make it easier to pass another vehicle safely:

- Pass another vehicle only where road signs allow it and obey the speed limits.
- Make sure that you are able to overtake the other vehicle with no danger and check to be sure there are no other vehicles trying to overtake you as you are preparing to pass.
- Make sure your vehicle has enough accelerating power for you to pass the other vehicle.
- After overtaking the other vehicle, allow enough space behind you before pulling back over into the right lane.

Length of a double road train

Because of its length, a double road train does not perform as well as shorter vehicles when you are passing or are forced to make evasive manoeuvres to avoid colliding with other vehicles. Also, crosswinds tend to aggravate this problem, especially when you are negotiating a curve. You have to pay careful attention to these phenomena so that you can anticipate how your vehicle will react. This will enable you react in time and maintain control of your vehicle.

Number of articulations

When driving a double road train, there are numerous factors that determine how much space you will need in order to safely execute various manoeuvres, particularly when turning. Among other things, you must consider:

- the number and position of the axles;
- the length of the tractor and of each semi-trailer;
- the number of articulations.

The more articulations a vehicle combination has, the greater the risk of the second semi-trailer weaving back and forth. When this occurs, the second semi-trailer may deviate from the tractor's trajectory and cross over into the next lane. This can lead to accidents with other vehicles and even cause the double road train to overturn.

Since double road trains take up a lot of space on roads, the risks of colliding with roadside installations, parked vehicles or pedestrians are greater.

Hitching and Unhitching Methods

Hitching and unhitching a tractor and a semi-trailer

Hitching a tractor and a semi-trailer both equipped with air suspension

It is very important to master the correct technique for hitching a semi-trailer. Any error during the hitching process or using the wrong method can cause an accident or equipment failure.

You must be sure to follow the same steps and proceed in the same manner each time you hitch a semi-trailer. This saves time and ensures that you will be able to drive safely.

The following method explains how to correctly hitch a semi-trailer equipped with air suspension (i.e. one not equipped with a manual air release valve) to a road tractor equipped with the same type of suspension.

Pay close attention so that you can perform the manoeuvres safely.

Steps to follow

1) Check the tractor's fifth wheel

› Make sure the fifth wheel is well lubricated and that its mechanisms show no sign of damage.

› Make sure the fifth wheel is firmly anchored to the tractor chassis frame.

› Make sure the fifth wheel is in the correct position to be hitched:

- fifth wheel tilted down towards the rear;
- fifth wheel jaws completely open.

› In winter, remove any snow that has accumulated to make sure the fifth wheel locks correctly.

2) Position the tractor in front of the semi-trailer

› Check the surroundings to make sure you are in a good location for hitching the semi-trailer safely.

› Line the tractor up in a straight line with the semi-trailer. Roll down the window to hear what is going on and look in the side mirrors to check both sides of the semi-trailer. Do not hitch the semi-trailer until the tractor is lined up with the semi-trailer.

› Back up slowly and make sure the axle fits under the semi-trailer.

› Put on the tractor's parking brake, shift into neutral, switch on the hazard lights and parking lights, and climb down from the tractor cab using the three-point contact method.

› Adjust the height of the semi-trailer:
  - if it is too high, lower the semi-trailer using the landing gear;
  - if it is too low, lower the tractor's suspension or raise the semi-trailer using the landing gear.

› The upper coupling plate of the semi-trailer should be slightly lower than the fifth wheel plate when it is at its pivot point. If the upper coupling plate is lower, the semi-trailer will be slightly raised when it is hitched, making it easier for the locking mechanism to engage.

› Check the condition of the kingpin and the upper coupling plate on the semi-trailer. If applicable, remove the latch on the kingpin.

3) Hitch the semi-trailer

› Climb into the tractor and release the parking brake.

› Back the tractor up slowly under the semi-trailer, as you check the side mirrors, until the upper coupler kingpin is positioned inside the fifth wheel. This manoeuvre must be performed correctly to make sure that the locking mechanism is engaged and to prevent the kingpin from striking hard against the inside of the fifth wheel.

› Check that the fifth wheel is locked securely by trying to move the tractor forward. Stop as soon as you feel resistance.

› Put on the tractor's parking brake and shift into neutral.

› Climb down from the tractor using the three-point contact method.

4) Inspect the coupling and complete the procedure

› Look under the semi-trailer at the rear of the tractor to:
  - check that the kingpin is fully inserted into the jaws, using a flashlight if necessary;
  - check that the fifth wheel locking mechanism is in the lock position. If it does not lock, ask a mechanic for help.

› Connect the electrical cord and air lines and make sure that they cannot be damaged by the vehicle's movements.

› Raise the landing gear and place the crank in the bracket.

› Turn on the semi-trailer's air suspension by hand if necessary.

Unhitching a semi-trailer with air suspension

First make sure that you are in a good spot for unhitching the semi-trailer. Choose an area where the ground is firm enough and flat enough to support the weight of the semi-trailer.

Steps to follow

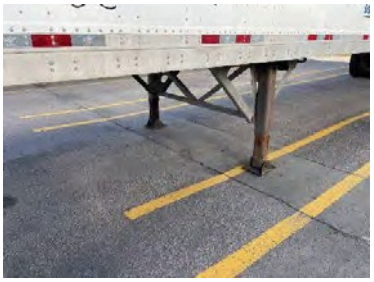
1) Park the tractor and semi-trailer in the correct position for unhitching

› Line the tractor up straight with the semi-trailer.
› Put on the tractor and semi-trailer parking brakes, shift into neutral and climb down from the tractor using the three-point contact method.
› Check the condition of the semi-trailer (lights, tires, etc.).
› Lower the landing gear. The pressure applied by the landing gear varies based on the type of terrain, the load and the height of the road tractor. Disconnect the electrical cord and air lines.

› Connect them to the dummy glad hands behind the tractor cab.
› Pull the fifth wheel release lever or levers until they are in the “open” position.

2) Unhitch the tractor from the semi-trailer

› Climb back into the tractor, press down on the tractor’s parking brake knob and select the right gear.



› Move the tractor forward approximately 15 cm to release the kingpin from the fifth wheel and bring the vehicle to a stop.
› Lower the tractor’s air suspension and move forward slowly.
› Bring the tractor to a stop while the last axle is still under the semi-trailer. This precaution ensures that the semi-trailer will be supported if the landing gear fails or sinks into the ground.
› While still in the cab, check that the semi-trailer is immobilized before driving forward, or climb down from the tractor to check the landing gear if you are in doubt about its stability. If you climb down from the tractor, always use the proper safety procedure:
  • Put on the tractor’s parking brake and shift into neutral.
  • Before climbing down from the tractor, switch on the semi-trailer’s hazard lights, parking lights and clearance lights.
  • Climb down from the tractor using the three-point contact method.

› Slowly move the tractor away from the semi-trailer and turn the tractor’s suspension back on.

Hitching and unhitching a double road train

A second semi-trailer can be hitched to the first semi trailer using the following equipment:

› an A-converter dolly with one pintle eye, in the case of an A-double road train;
› a sliding fifth wheel below the first semi-trailer or a stationary fifth wheel secured to the back of the semi-trailer, in the case of a B-double road train;
› a tandem-axle B-converter dolly with two pintle eyes, in the case of a C-double road train.

This equipment can be used for hitching all double road trains.

Hitching a B-double road train

Steps to follow

1) Position the tractor and the first semi-trailer already hitched together in front of the second semi-trailer

› Hitch the first semi-trailer to the tractor following the method described previously.

› Line up the tractor and the first semi-trailer combination in a straight line with the second semi-trailer. Roll down the window to hear what is going on and look in the side mirrors to check both sides of the semi-trailer. Do not hitch the second semi-trailer until the tractor and the first semi-trailer combination is lined up with it.

› Back up slowly and make sure the axle fits under the second semi-trailer.

› Put on the tractor and the first semi-trailer parking brakes, shift into neutral and climb down from the tractor using the three-point contact method.

2) Inspect the second semi-trailer

› Check the condition of the kingpin and the upper coupling plate. If applicable, remove the latch on the kingpin.

› Adjust the height of the second semi-trailer:

- if it is too high, lower it using the landing gear;
- if it is too low, raise it using the landing gear.

3) Hitch the second semi-trailer

› Climb into the tractor and release the parking brakes.

› Slowly back up the tractor and the first semi-trailer hitched together under the second semi-trailer, as you check the alignment in the side mirrors. Continue backing up until the upper coupler kingpin is positioned inside the fifth wheel. This manoeuvre must be performed correctly to make sure that the locking mechanism is engaged and to prevent the kingpin from striking hard against the inside of the fifth wheel.

› Check that the fifth wheel is locked securely by trying to gently move the tractor and the first semi-trailer forward.

› Stop as soon as you feel resistance.

› Put on the tractor and the first semi-trailer parking brakes, shift into neutral and switch on the semi-trailer's hazard lights, parking lights and clearance lights.

› Climb down from the tractor using three-point contact method.

› Look under the second semi-trailer at the rear of the trailer hitch to:

- check that the kingpin is fully inserted into the jaws, using a flashlight if necessary;
- check that the fifth wheel locking mechanism is in the lock position.

4) Inspect the coupling, and complete the procedure

› Connect the electrical cord and air lines. Make sure that they cannot be damaged by the vehicle's movements.

› Open the air line shut-off valves of the first semi-trailer.

› Raise the landing gear, place the crank in the bracket and, if necessary, arrange any additional brackets.

› Turn on the second semi-trailer's air suspension, if necessary.

Hitching an A-double road train or C-double road train

Steps to follow:

1) Position the tractor and the first semi-trailer combination to attach the dolly

› Hitch the first semi-trailer to the tractor using the method described above.

› Back up the tractor and the first semi-trailer combination in front of the dolly, so that the dolly's pintle eye is lined up straight with the first semi-trailer's pintle hook.

› Put on the tractor and first semi-trailer parking brakes, shift into neutral and switch on the appropriate hazard lights and parking lights.

› Climb down from the tractor using the three-point contact method.

› Check that the dolly's pintle eye and the first semi-trailer's pintle hook are lined up correctly.

› Climb back into the cab to back up the tractor and the first semi-trailer combination until the dolly's pintle eye is centred in the first semi-trailer's hook so that the dolly can be hitched.

› Climb back down from the tractor using the three-point contact method after completing standard procedures.

› Lower the dolly's drawbar and put the safety catch in place.

› Connect the dolly's air lines and electrical cord to the first semi-trailer and install the safety chains.

› Open the air line shut-off valves from the first semi-trailer to the dolly.

› Check the general condition of the dolly.

› Climb into the tractor and release the parking brakes.

› Back up the tractor, first semi-trailer and dolly combination until approximately 30 cm in front of the second semi-trailer.

› Put on the tractor and semi-trailer parking brakes, shift into neutral, switch on the hazard lights and parking lights, and climb down from the tractor using the three-point contact method.

2) Inspect the second semi-trailer

› Look under the second semi-trailer and check that the dolly's fifth wheel and the kingpin are lined up.

› Check the condition of the kingpin and the upper coupling plate. If applicable, remove the latch on the kingpin.

› Adjust the height of the second semi-trailer:

- if it is too high, lower it using the landing gear;
- if it is too low, raise it using the landing gear.

3) Hitch the dolly to the second semi-trailer

› Make sure that the second semi-trailer's upper coupling plate is slightly lower than the dolly's fifth wheel plate when it is at its pivot point. If the second semi-trailer's upper coupling plate is lower, it will be slightly raised when it is hitched, making it easier for the locking mechanism to engage.

› Climb into the tractor and release the parking brake.

› Slowly back up the tractor, first semi-trailer and dolly combination under the second semi-trailer, as you check the side mirrors, until the upper coupler kingpin is positioned inside the fifth wheel. This manoeuvre must be performed correctly to make sure that the locking mechanism is engaged and to prevent the kingpin from striking hard against the inside of the fifth wheel.

› Test the locking mechanism by moving the vehicle combination forward until you feel resistance.

4) Inspect the coupling and complete the procedure

› Put on the tractor and the first semi-trailer parking brakes, shift into neutral, switch on the hazard lights and parking lights, and climb down from the tractor using the three-point contact method.

› Visually inspect the locking mechanism, using a flashlight, if necessary.

› Connect the air lines and electrical cord to the second semi-trailer.

› Open the dolly's air line shut-off valves.

For double road trains that are 25 m long or shorter, you may prefer to hitch the dolly to the tractor first in order to position the dolly in front of the second semi-trailer. This procedure is described briefly below:

1) Hook the dolly to the tractor using the drawbar.
2) Line up, unhook and position the dolly approximately 30 cm in front of the second semi-trailer, making sure the axle fits under the second semi-trailer (do not hitch the dolly to the second semi-trailer at this point).
3) Hitch the first semi-trailer following the usual procedure.
4) Position the tractor and the first semi-trailer in front of the dolly.
5) Hook the dolly to the first semi-trailer already hitched to the tractor.
6) Back up the vehicle combination and hitch the dolly to the second semi-trailer, then check all the usual items. Do not forget to check the dolly, air lines, electrical cord and safety chains.

Unhitching a double road train

To unhitch an A-double road train, B-double road train or C-double road train, follow the procedure used for unhitching a single semi-trailer from a tractor.

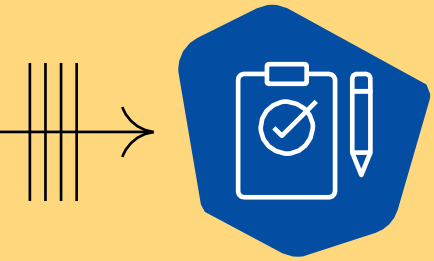
When unhitching a B-double road train, however, additional landing gear, if the vehicle is so equipped, must be placed under the second semi-trailer to prevent it from falling over.

Follow the steps explained below to unhitch an A-double road train or a C-double road train:

1) Park the double road train in a straight line in a location where there is enough space and on a firm level surface.
2) Close the air shut-off valves from the dolly to the second semi-trailer.
3) Unhitch the second semi-trailer using the same method you would to unhitch the first semi-trailer.
4) Unhook the dolly in the case of an A-double road train or a C-double road train. The dolly can be positioned a short way in front of the second semi-trailer or in any other suitable location.

   Caution: Never unlock the heel of the tow hook when the dolly is still under the second semi-trailer, because the dolly's drawbar could fly up without warning. Since it is almost impossible to straighten out a drawbar, a dolly with a damaged drawbar will likely never be used for service again.
5) Unhitch the first semi-trailer from the tractor following the usual procedure.

Even though you do numerous checks all throughout the hitching process, you have to perform a circle check on the entire vehicle combination when everything is hitched up and ready to go. This is your opportunity to do a final check on the hitching system before heading out on the road.



Exercise 4.3

Indicate whether each of the following statements is true or false.

Statements	True	False
1. To hitch a semi-trailer, the upper coupling plate on the semi-trailer must be slightly lower than the fifth wheel plate at its pivot point.	◯	◯
2. To unhitch a semi-trailer, you must move the tractor forward slightly to release the upper coupler kingpin, stop the vehicle, lower the tractor's suspension and drive forward slowly.	◯	◯
3. In winter, you do not need to worry about snow accumulating around the fifth wheel locking mechanism considering the weight of the equipment.	◯	◯
4. When hitching a semi-trailer, trying to move the tractor forward is the only way to make sure the fifth wheel is locked.	◯	◯
5. Hitching a B-double road train requires the use of a dolly.	◯	◯

The answer key is provided at the end of this guide.

Driving in Dangerous Situations

From time to time, you will be faced with dangerous driving situations. When this happens, the best course is to remain calm. These are the times when you will need to rely on your driving skills and knowledge to help you react quickly and effectively.

This chapter provides advice to help you cope with certain problems or—better still—prevent them.

What should you do when you get a flat tire?

While travelling, you may have a tire blowout or notice that one of your tires is leaking air. The impact of a flat tire differs depending on whether your vehicle is equipped with dual or single wheels and where the tire is located.

Flat tire: rear tire on a dual-wheeled vehicle

A flat tire on a dual-wheeled semi-trailer may have very little impact on your driving, since vehicle stability is maintained. However, the extra weight on the other wheel may damage it. If you have a blowout on one of the tractor's rear tires, it may cause the rear end of the tractor to vibrate.

Often the best way to determine whether you have a flat tire, other than noise or vibration, is to pull over and check for yourself. If you have a flat, you must cease operating your vehicle until the tire is repaired or replaced.

Flat tire: front tire, or rear tire on a single-wheeled vehicle (wide-tread)

A flat in one of the front tires, or in one of the rear tires on a single-wheeled vehicle, can often cause you to lose control of your vehicle. When one of your front tires goes flat, the vehicle tends to veer towards the side where the damaged tire is located. If the flat is a rear tire, the vehicle usually becomes unstable. You will have to adjust the way you drive to compensate for the imbalance and bring the vehicle to a safe stop.

To maintain control of your vehicle:

- Grip the steering wheel firmly so that you can steer your vehicle out of the traffic lane.
- Slowly ease off the accelerator and gradually apply the brakes to bring your vehicle to a stop in a safe location.

It is natural to want to stop your vehicle immediately when a flat occurs, but instead of slamming on the brakes, you must maintain your speed and concentrate on easing off the road as you gradually reduce your speed.

What is hydroplaning and how should you react?

Hydroplaning occurs when vehicle tires lose traction, particularly when puddles form on the road surface due to rain. A thin layer of water then forms between the tire and the road surface, causing the tires to lose their grip on the road. Hydroplaning can be even worse if your tires are underinflated or the tread is worn.

What should you do?

To maintain control of your vehicle:

- take your foot off the accelerator;
- avoid braking, since this could cause you to lose control of your vehicle. Once you have regained control of your vehicle, resume normal speed.

What causes skidding?

Most of the time, skidding is caused by travelling too fast on damaged, slippery or snow-covered road surfaces. When this happens, the tires lose their traction and tend to skid. This can happen if you brake too abruptly, if you take a curve too quickly, or if you are driving up or down a hill.

Braking abruptly

Braking can sometimes cause your wheels to lock up and send your vehicle into a skid. When the wheels of a vehicle not equipped with an ABS brake system are locked, traction is reduced and tires skid, so that your vehicle requires a greater stopping distance. You must adjust your driving to maintain control of your vehicle.

Driving up or down a hill

You may go into a skid when travelling up or down a hill if the force of acceleration is greater than the traction between your tires and the pavement. This is most likely to happen when the pavement is slippery or if you are travelling too fast for the condition of the road surface. If travelling up a hill, the wheels spin in place and the rear end of the vehicle veers to the side.

If travelling down a hill, the risk of skidding is greater still if the pavement is slippery or if you try to brake to slow down your vehicle.

How to avoid skidding

It is very hard to regain control of a heavy vehicle once it goes into a skid. The best approach is to drive defensively and try to avoid skidding.

WAYS TO AVOID SKIDDING

- Reduce your speed as dictated by road conditions and layout.
- Maintain a sufficient distance between your vehicle and other road users, especially when the pavement is slippery. This will help you avoid having to brake abruptly, which is one of the most frequent causes of skidding.
- Check your semi-trailer in the side mirrors every time you brake. Let up on your brakes if the semi-trailer is starting to skid.
- Do not use the hand brake to slow down your vehicle.

How to recover when you start to skid?

In situations where defensive driving is not enough to avoid skidding, the first thing to do is determine the cause of the skid.

If the skid is caused by overbraking:

› Let up on the brake pedal so that your wheels start turning again and the tires can grip the pavement.

If the skid is caused by rapid downshifting:

› Press down on the clutch.

Important: Use the brake pedal as needed. Once you have recovered control of your vehicle, shift into the appropriate gear.

If the skid is caused by overaccelerating:

› Slowly release the accelerator in order to regain control of your vehicle.

Important: Change gears as needed to keep your wheels from spinning, while bearing in mind the effects of compression by the engine and the supplemental brakes.

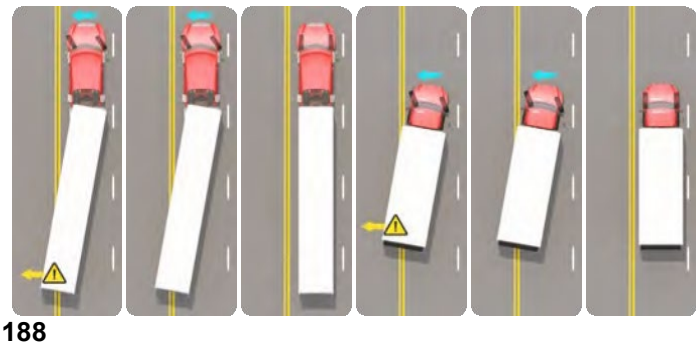
Maintaining steering control

Whether a skid is caused by braking abruptly, accelerating quickly or a loss of traction in a curve, the rear end of the vehicle will veer to the left or to the right. To stop your vehicle from skidding completely out of control, you must turn your steering wheel in the same direction your vehicle is skidding.

If the rear end of the vehicle is skidding to the left:

› Turn the steering wheel to the left to pull the vehicle back into a straight line.

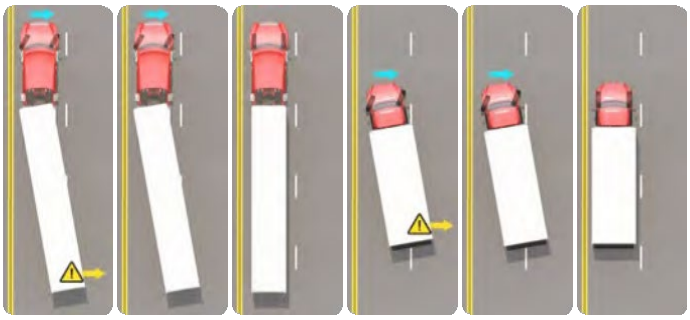
› When the vehicle is almost back in line, turn the steering wheel to the right until the front wheels are lined up straight.



If the rear end of the vehicle is skidding to the right:

› Turn the steering wheel to the right to pull the vehicle back into a straight line.

› When the vehicle is almost back in line, turn the steering wheel to the left until the front wheels are lined up straight.



What causes jackknifing?

Jackknifing is caused when the forward thrust of the semi-trailer pushes the tractor over to the left or to the right. The tractor and semi-trailer are said to have jackknifed if they wind up positioned at an angle of less than 90°.

If you notice that you are losing traction, you must quickly let up on the accelerator or the brake pedal, as applicable, to avoid jackknifing.

Skidding, overturning and jackknifing

The most common accidents involving a double road train or LCV are skidding, overturning and jackknifing.

These kinds of accidents usually occur when the vehicle's centre of gravity is too high or too low, or when the road is wet or covered with snow.

Skidding usually occurs on dry pavement when your vehicle's centre of gravity is very high. The danger of overturning is generally greatest in a curve or during high winds.

Jackknifing, in most cases, is the result of braking abruptly on a wet or snow-covered road surface with a vehicle that has a fairly low centre of gravity. The best way to prevent these types of accidents is to be alert for situations where they are likely to occur and reduce your speed.

Potential skidding, overturning and jackknifing situations

- Skidding, overturning and jackknifing are usually due to driving too fast, momentary distractions, errors in handling the steering wheel, or braking abruptly. For example, if you are driving too fast and you miscalculate the amount of space you need to take a highway exit, you may hit the edge of the exit ramp or the guard rail, go into a skid or even cause your vehicle to overturn.
- When one wheel of a double road train skids onto the shoulder, this can be enough to send your vehicle into the ditch. To avoid this, stay well within your lane and make sure none of your wheels cross over onto the shoulder.
- Too much or too little air in your tires can also cause an accident. An empty double road train with over-inflated tires can jackknife if you brake abruptly. This type of accident can occur during a hot summer day, for example, after you have been driving your vehicle a long time. Tires that are under-inflated (a "slow leak," tires that are completely deflated, etc.) can cause you to lose control of your vehicle.
- If your brakes are not properly adjusted, they can cause you to jackknife.

Tips to prevent jackknifing

Jackknifing usually occurs when you reduce your speed while negotiating a curve or when turning. If you drive an LCV or double road train, you have to take into account the numerous points of articulation of your vehicle combination and adjust your speed to road conditions. Wind, visibility and tire traction are factors you must always consider.

For example, when the angle of the jackknife is over 15°, it means you have reached the point of no return. At this point, it is almost impossible to regain control of your vehicle.

The best way to avoid skidding, overturning and jackknifing is simply to practise the basic techniques of defensive driving: **obey the speed limits and treat other road users courteously**.

How to make an emergency stop?

Any driver can be confronted by unexpected hazards. Whether you are driving a heavy vehicle combination, straight-body truck or bus, you must slow down as soon as you notice any of the following potential hazards:

- A vehicle up ahead is braking for no apparent reason.
- There are vehicles making frequent stops (delivery trucks, taxis, buses).
- There are vehicles parked by the side of the road.
- The road is slippery.
- Your field of vision is blocked.

But even if you practice defensive driving , situations can arise that force you to brake abruptly. When this happens, you must be able to maintain your vehicle in a straight line, stay on course and make a turn if you need to. Be extra cautious when braking with a loaded vehicle.

Today, most heavy vehicles are equipped with an anti-lock brake system (ABS) that prevents the wheels from locking if the brakes are applied abruptly. However, circumstances may require you to drive a vehicle not equipped with an ABS system. If so, you must be able to use the proper technique to make an emergency stop without causing the wheels to lock up, as explained below:

1) Press down on the brake pedal as soon as the situation requires.

2) Gradually increase pressure on the brake pedal, as far as you can without causing your wheels to lock up, until you bring your vehicle to a complete stop.

If you see that your wheels are locking up, let up on the brake pedal slightly to keep from losing control of your vehicle. Resume pressure on the brake as soon as the wheels start turning again, making sure that the wheels do not lock up.

If your brakes should fail despite all your efforts…

You have to apply your brakes very often while driving. How well they perform depends on the condition they are in and how you use them. Your brakes may perform poorly or fail due to:

- a loss of air pressure or leakage of brake fluid;
- damaged wheels;
- overheating;
- wear;
- improper adjustment.

You should also monitor the air pressure gauge frequently to be sure you have enough air pressure to operate the brakes.

Prevention is the best way to minimize the risk of mechanical failure. See Chapter 6 for information about circle checks.

Practice defensive driving to minimize braking and use proper braking techniques— these are the best ways to avoid failure of your brake system.

How to bring your vehicle to a stop

The technique to use for stopping your vehicle depends on the kind of brake system you have.

Vehicle with hydraulic brakes

1) Pump the brake pedal (quick repeated strokes) to generate pressure in the brake lines so that you can stop your vehicle.
2) Downshift.
3) Apply the parking brake (which also serves as the emergency brake in most hydraulic systems) if you are unable to generate enough pressure in the brake lines by pumping your brakes. Try not to cause your wheels to lock up.
4) Look for a place where you can stop without endangering other road users.
5) Make sure that your vehicle is completely stationary once you have come to a stop.
6) Switch off the engine.

Vehicle with air brakes

IMPORTANT

If the low-pressure warning light comes on (usually along with a buzzer) or if the air pressure gauge warns you of a drop in pressure, this means that there is not enough air pressure to work the service brakes properly. When this happens, even if your emergency brake takes over to bring you to a gradual stop, you must stop as quickly as you can **because it will soon become impossible to use the service brakes**.

1) Apply the brakes to slow the vehicle down gradually, but without pumping the brake pedal.
2) Downshift.
3) Look for a place where you can stop without endangering other road users.
4) Make sure that your vehicle is completely stationary once you have come to a stop.
5) Switch off the engine.

If your brakes fail while driving down a hill

Brakes are designed to withstand a certain amount of heat, but if you apply them too often or for too long at a time, they can overheat.

Before starting down a steep slope, make sure that your brakes are in good condition. If you are not sure, pull over and check them.

If, despite all of these precautions, you realize that your brakes are not working properly, you will have to find a way of slowing down and stopping your vehicle quickly without losing control of it. Time is of the essence here because the greater your speed, the harder it will be to stop your vehicle.

If there is no runaway lane with an arrester bed, steer towards a spot where you can stop your vehicle safely. You must find an appropriate place to pull over as quickly as possible.

If there is a runaway lane with an arrester bed, use it. It will enable you to safely bring your vehicle to a complete stop.

Before starting down a hill, you can tell whether there is a runaway lane up ahead. First you will see a LIT D'ARRÊT sign indicating the distance to the runaway lane with its arrester bed, and then an S.O.S. PENTE RAIDE sign indicating you are arriving at the top of an especially steep slope.

If your brakes fail, follow the instructions provided by these signs. They will guide you to the runaway lane.

If your vehicle catches fire

To avoid a fire, which could cause serious damage or injury, there are a number of preventive measures you should take before beginning a trip and at each stop along the way.

You should check temperature readings continuously and use your side mirrors to check for smoke coming from the rear of your vehicle.

What to do in the event of an emergency

If a fire breaks out, the first thing to do is find a place at some distance from buildings and other vehicles where you can pull off the road. Switch off the engine and move away from your vehicle if there is a credible risk of explosion. Stop traffic and direct any people in the vicinity away from your vehicle. Then call for assistance.

Once you have done all this, take the steps described below, if it is possible for you to do so. The order in which you perform these tasks may vary depending on what type of fire you are dealing with and where it is located in the vehicle:

1) Unhitch your semi-trailer and move the tractor away from it.
2) Switch off the engine if you have not already done so.
3) Use a fire extinguisher, if possible.

If the fire you are attempting to extinguish is in the engine compartment, raise the hood. Most important of all, do not use water to put out a fire that is being fed by fuel.

Be careful using a fire extinguisher and keep your back to the wind.

If an animal strays onto the road

Road signs are used in wooded areas to warn that there might be wildlife in the vicinity. Wildlife can venture onto the road, interfere with traffic and sometimes cause serious accidents. Be on guard at all times, especially at night, because animals are attracted by headlights.

In a high-risk area, stay alert:

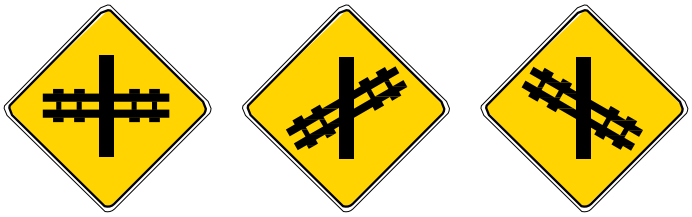
- Obey the speed limits.
- Be extra careful in areas of reduced visibility due to a bend in the road, a hill or heavy vegetation by the roadside.
- Be extra careful in the early morning, at dusk and in the evening, particularly during the months of May, June, October and November.

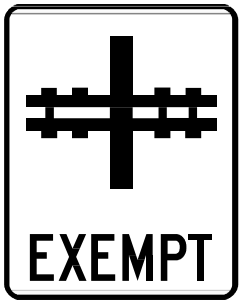
If an animal is on the road:

- Slow down and press your brakes several times to alert motorists behind you.
- Be alert in case there are other animals in the vicinity.
- Do not rely on gadgets such as deer whistles. They have not been proven effective.

Level crossings

You must be very cautious when approaching a level crossing. Road signs marking the location of a train track may be wholly or partially obscured at certain times of the year due to snow, weeds or even tree branches.





You must also be conscious of the risk of colliding with a train at level crossings. Because of their size and the cargo they carry, heavy vehicles usually take longer than other vehicles to cross train tracks. Avoid having to change gears when travelling through a level crossing. If you make an error changing gears or if your vehicle stalls, it could prove disastrous. The risk is greater still for buses, where the driver is also responsible for safety of the passengers. Bus drivers and drivers of vehicles carrying dangerous substances are subject to special rules at level crossings.

You must take special precautions when you see a warning sign of the type illustrated below. It means that the level crossing ahead is designed in such a way that you must slow down to less than 70% of the posted speed limit in order to cross safely. For example, if the posted speed limit is 70 km/h, you must reduce your speed to no more than 20 km/h before crossing the railroad tracks.

Pulling over to the side of the road

If you need to pull over to the side of the road, you should turn on your hazard lights. This is especially recommended at night, so that other drivers will not be fooled into thinking your vehicle is still moving and attempt to follow you.

Using warning signals in the event of an emergency

In the event of a breakdown or if a mechanical problem arises and you need to stop your vehicle on the roadway, you must use, in addition to the hazard lights, flares, lamps or triangle reflectors to show that your vehicle is stopped. If using flares, remember to replace them when they burn out so as to maintain a continuous warning signal.
Use of flares is strictly prohibited if your vehicle is carrying flammable, explosive or dangerous substances or materials, such as fuel, paint thinners, propane gas or dynamite.

Lamps

Flares

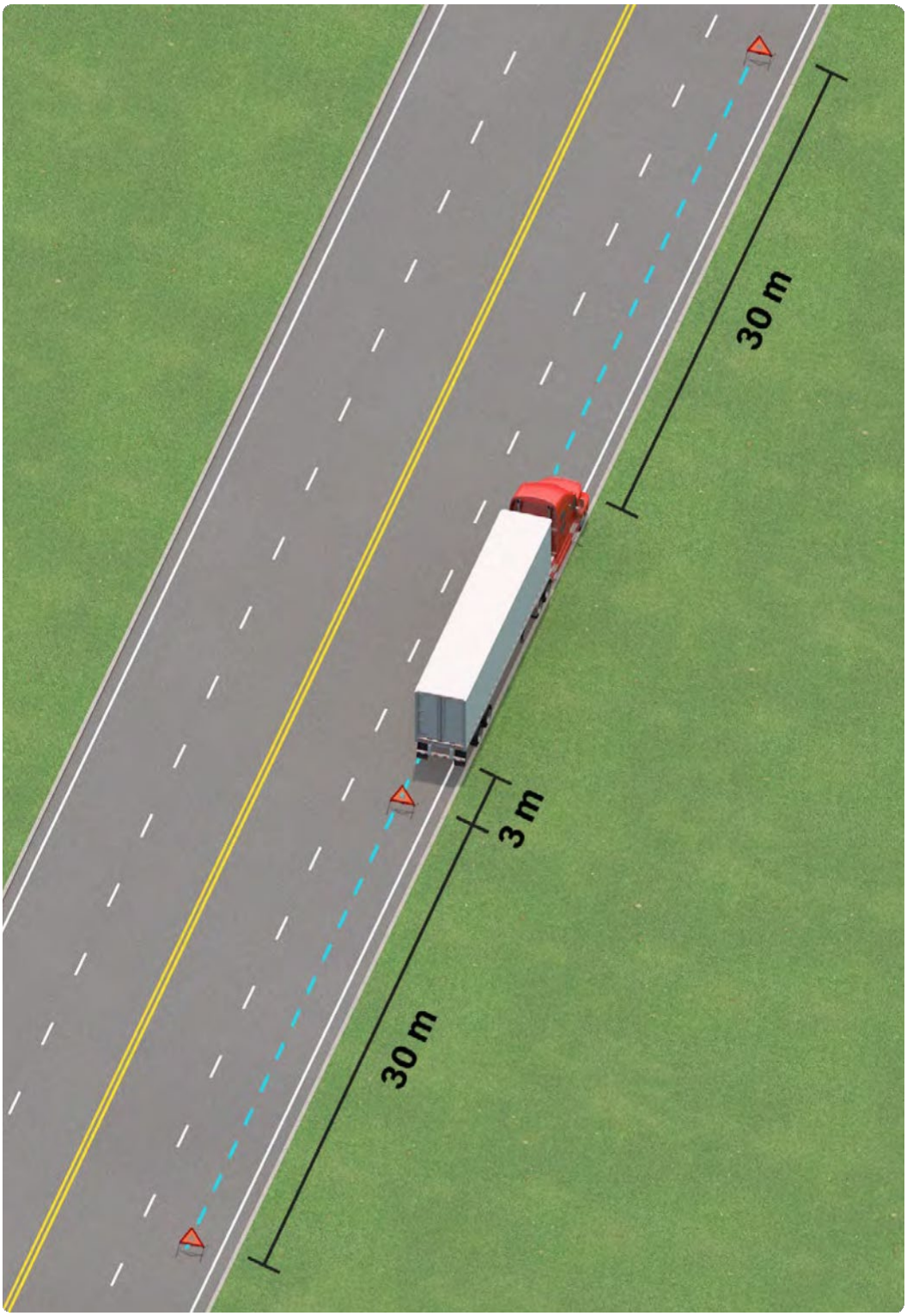
Triangle reflector

There are two procedures for positioning warning signals, depending on whether you are stopping on a secondary road or a limited-access highway.

Pulling over on a secondary road

On a secondary road, warning signals should be placed as follows:

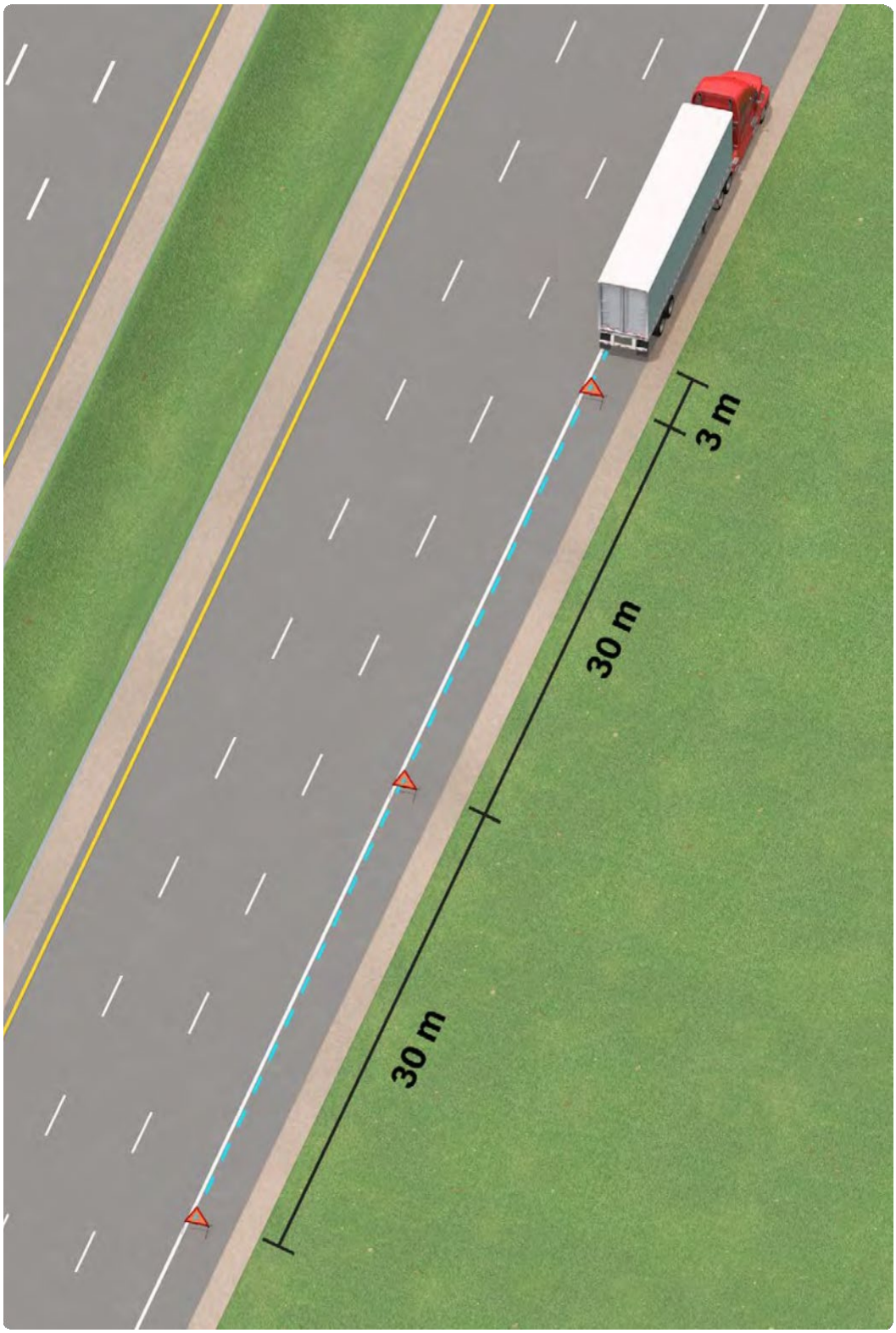
1) The first warning signal should be placed on the ground approximately 3 m behind the stopped vehicle and in line with the left side of the vehicle.
2) A second warning signal should be placed on the ground approximately 30 m behind the vehicle and in line with the first warning signal.
3) A third warning signal should be placed approximately 30 m ahead of the vehicle and in line with the left side of the vehicle.



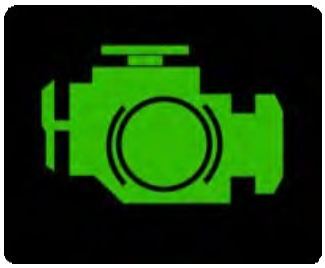
Pulling over on a limited-access highway

On a limited-access highway, a one-way road, or any other public thoroughfare where there is no oncoming traffic, warning signals should be placed as follows:

1) The first warning signal should be placed on the ground approximately 3 m behind the stopped vehicle and in line with the left side of the vehicle.
2) A second warning signal should be placed on the ground approximately 30 m behind the vehicle and in line with the first warning signal.
3) A third warning signal should be placed on the ground approximately 60 m behind the vehicle and in line with the other warning signals.



Supplemental brake systems



Many vehicles are equipped with a supplemental brake system to help you reduce vehicle speed. These brakes can be used alone or in combination with the service brakes. They allow you to slow down or stabilize vehicle speed in certain specific situations. However, they will not bring your vehicle to a stop.

These types of brake systems are options and do not come as standard equipment on your vehicle. They are added to other vehicle components. Engine brakes use engine compression, whereas retarders are installed on other parts of the vehicle.

There are various categories of supplemental brakes:

- An engine compression brake is installed on the engine and converts it into an air compressor. This is the most popular kind of supplemental brake on the market.
- An exhaust brake retarder or turbocharger also converts the engine into an air compressor by re-routing (choking) gases coming out of the exhaust pipe.
- An electromagnetic retarder (or eddy-current brake) uses the action of a magnetic field to slow the vehicle. The magnetic field causes soft iron discs linked to a transmission component to rotate.
- A hydrodynamic (or hydraulic) retarder uses the pressure of motor or transmission oil to slow the vehicle.

Supplemental brakes are especially recommended when driving a loaded vehicle down a slope. They allow you to maintain a constant speed without constantly applying your service brakes.

However, you must pay careful attention to the noise generated by the use of engine brakes. Make sure that your vehicle's exhaust system is compliant and pay particular attention to its condition, notably when you are making circle checks.

How they work

Engine brakes and retarders are activated by means of a switch or lever. They are operable as soon as you switch them on or pull the lever, but do not begin to work until you take your foot off the accelerator.

For retarders to work effectively, you must first shift into the right gear. This remark more specifically applies to engine compression brakes, which work very efficiently at maximum RPM.

For instructions on operating the type of supplemental brake installed on your vehicle, refer to the manufacturer's operating manual.

No matter what kind of engine brake or retarder is installed on your vehicle, the braking power is always applied to the drive wheels.

Anti-lock brakes

When faced with an emergency, you have to apply your brakes as quickly as possible, exert maximum force and maintain control of your vehicle. In such situations, a vehicle equipped with an anti-lock brake system (ABS)—also referred to as an "anti-skid brake system" or "anti-blocking system"—offers you several advantages, including greater vehicle stability, better steering control and, in some cases, shorter braking distance.

An anti-lock brake system goes into operation only when there is a risk of a wheel locking, such as when you have to apply the brakes abruptly. This is often the kind of situation where jackknifing and accidents occur. An ABS system helps to protect you against this.

With this kind of system, the braking force applied to the wheels is adjusted according to how well the tires grip the road. Sensors connected to a computer control the amount of air pressure flowing into the brake chambers so as to slow the vehicle down as quickly as possible without the wheels locking. Brake pressure is continually adjusted, based on vehicle speed and pavement conditions, to achieve optimal traction and braking.

If your vehicle is equipped with anti-lock brakes, when an emergency occurs, you must push the brake pedal all the way to the floor and hold it there. The anti-lock brake system automatically controls braking by producing a pumping effect.

ABS warning lights

On a vehicle combination, each unit in the combination that has an anti-lock brake system is equipped with a warning light that comes on in the event of a system failure. Although this situation does not prevent the vehicle from braking as usual, you should have your vehicle inspected.

The warning light on the trailer stays on for approximately three seconds and goes off when there is no longer a risk of a wheel locking. You can usually see this warning light in your side mirror when the vehicle is moving and you apply the service brake.

Eco-driving

Eco-driving consists of using driving techniques that reduce fuel consumption rates. This new approach:

› reduces fuel consumption;
› reduces environmental impact;
› takes account of technological progress;
› reduces maintenance costs;
› improves road safety while reducing stress.

Reduce

Why keep accelerating when getting ready to stop? To reduce your fuel consumption, simply reduce your speed. As with the connection between speed and aerodynamic drag, accelerating from 0 to 50 km/h consumes four times as much fuel as accelerating from 0 to 25 km/h. At high speed, even a slight reduction in acceleration will have a significant impact on fuel consumption.

Eliminate

Since accelerations are costly, why not try to eliminate them? To eliminate an acceleration, you have to reduce the need to brake, and, consequently, the need to accelerate again.

The route you take is also important when it comes to maximizing opportunities for eliminating accelerations. For example, taking a route with traffic lights you can anticipate is better than taking a route with several stop signs (under the same conditions).

Recover

Why not take advantage of the opportunity to travel for free? To recover an acceleration, use the energy accumulated during the acceleration to slowly decelerate without having to brake over a long stretch of road, using the momentum of your vehicle to coast for free—not unlike coasting on a bicycle without having to pedal.

Driving techniques

1) Increase following distance.

› Assess the type of slowdown in front of you (minimal, partial or total) before braking.
› Change lanes or decelerate without braking if there is a significant traffic slowdown.

2) Anticipate traffic lights and adjust your speed.

› Observe how the next two or three traffic lights are synchronized.
› Memorize the timing pattern.
› Adjust your speed to reach the lights when they are green and reduce your wait time at the intersection.

3) Anticipate traffic and adapt your driving.

› Anticipate traffic slowdowns and stoppages caused by transit vehicles, curbside parking, unprotected left turns and limited-access highway ramps.
› Choose the more fluid lane and adjust your use of the accelerator to reduce unexpected braking.

4) Maintain a constant speed.

› Keep the accelerator in a stable position once you reach your desired speed.
› Use cruise control only on flat roads and only when there is no foreseeable slowdown.

6) Reduce your top speed between stops.

› Accelerate from 0 to 40 km/h instead of from 0 to 50 km/h when you know that you will have to stop again soon.

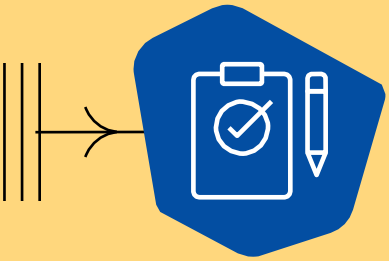
7) Take your foot off the gas pedal sooner to slow down.

› When no one is behind you, choose the best lane to decelerate over a long stretch of road.

Fuel savings

You can make the biggest fuel savings when driving on limited-access highways. We recommend that you stay at 90 km/h or under in order to minimize wear on the engine, tires and brakes, as well as save on fuel. When driving a tractor semi-trailer, if you reduce your cruising speed from 105 km/h to 90 km/h, you reduce your fuel consumption by an average of 10%. And the extra driving time this adds to your trip is not as great as you might think.

Today’s vehicles are more economical and run more efficiently than older models, provided you use the proper techniques for operating them.



Exercise 4.4

Indicate whether each of the following statements is true or false.

Statements	True	False
1. With hydroplaning, the way to maintain control of your vehicle is to apply the brakes.	◯	◯
2. If a blowout occurs in one of the dual wheels on a semi-trailer, you will feel the impact strongly.	◯	◯
3. If your vehicle begins to skid, you should turn your steering wheel in the same direction as the skid to avoid skidding completely out of control.	◯	◯
4. Using a deer whistle is a great way to avoid animal encounters on the road.	◯	◯
5. On slippery roads, braking abruptly can cause jackknifing.	◯	◯

The answer key is provided at the end of this guide.

Behaviours and Factors that Influence Safe, Cooperative and Responsible Driving

A number of factors may have an impact on driving a vehicle. These include driver behaviour, vehicle characteristics and your driving situation, including weather conditions and traffic density.

You must therefore adjust your driving as dictated by these factors. By exercising caution and employing the suggested techniques, you will develop the skills and habits of a real professional.

Road safety record

The Société de l'assurance automobile du Québec (SAAQ) issues an annual road safety record that presents the number of victims involved in traffic accidents on Québec roads. It includes detailed statistics on the types of road users involved in traffic accidents, their injuries and age groups, and the regions where the accidents occurred.

The SAAQ bases its road safety improvement efforts on the numerous factors and issues that have an impact on the road safety record.

The causes most often attributed to heavy vehicle drivers involved in accidents resulting in bodily injury are distracted driving, reckless speeding, and unsafe and inappropriate behaviours, such failing to yield the right-of-way or failing to obey a stop sign or red light.

For more information, visit the SAAQ web page on the road safety record.

Road safety strategy

With its 2021-2025 road safety strategy, the SAAQ aimed to improve the road safety record in the context of the growing number of road users and increasingly diverse modes of transportation.

A special focus was placed on sharing the road, and in particular the many challenges involved in sharing the road with heavy vehicles.

The SAAQ developed action plans for six priority areas, each with its own set of objectives and success indicators. The six priority areas were: distracted driving, speeding, impaired driving, fatigue, sharing the road and dangerous behaviours.

The SAAQ's new road safety strategy will be available soon.

For more information, visit the SAAQ web page on the road safety strategy.

The Observe-Evaluate-Act (OEA) strategy

The Observe–Evaluate–Act sequence found in this chapter offers an effective method to visually explore or scan the road. Observing your surroundings helps you better evaluate the situation and, as a result, respond appropriately. That is why it is essential to see well and, more importantly, to anticipate well.

You have to remain attentive to what is going on around your vehicle, but also be prepared for any unexpected hazards that might otherwise catch you off guard.

To do this, you should make it a habit to employ the following strategies:

OBSERVE attentively what is happening on and near the road to avoid any surprises and any risk of collision with another vehicle. You have to become a careful observer in order to drive safely and responsibly.

Do not stare at a single fixed point up ahead on the road; instead, look at what is going on up ahead, to the sides and in your mirrors. You need to identify potential dangers that pose a risk of accident. You have to read the road. Road signs enable you to adjust your speed to the road environment. By maintaining enough space between your vehicle and other road users, you can help ensure you will have enough time to react if an unexpected hazard arises.

EVALUATE the situation as best as you can to avoid a collision. This step consists of analyzing what is the best course of action: for example, slow down, change lanes, turn, or even use your horn. Before setting out, you should know your route, what kind of cargo you are carrying and what kind of road conditions you will be facing.

ACT by performing the right manoeuvre at the right moment. As a professional driver, you will encounter countless situations that will force you to make quick decisions. If you have acquired the proper knowledge and skills, you will be that much better prepared when something unexpected occurs.

A GOOD EXAMPLE TO FOLLOW…

Mark, an experienced driver, is driving in the city and scans the road to the front and sides of his vehicle. He sees that the traffic light ahead has been green for a while and anticipates that it will turn red before he reaches the intersection. He therefore starts to slow down in case he needs to stop. By observing the road environment, traffic lights and road signs in advance, just like Mark, you will have the time you need to react.

Stay alert

Driver inattention is a factor in most accidents resulting in bodily injury that involve a truck. Fatigue, distraction, anger, frustration, stress, alcohol, medication and drugs are all common causes of inattention, although fatigue is recognized as the main cause.

There are also certain monotonous aspects of driving that can provoke an almost hypnotic state. The layout of the road, over-familiarity with a route too frequently driven, and driving for long hours can all lead to “highway hypnosis.” If you find this happening to you, pull over as soon as you can to rest for a while. After that, take a break from time to time, every two hours if possible, or whenever you feel the need to stop.

Fatigue

Driver fatigue is one of the leading causes of traffic accidents, along with speeding, distraction and alcohol.

An in-depth study carried out in the United States shows fatigue to be one of the primary causes of fatal accidents for heavy vehicle drivers. In many such fatalities, health problems related to insufficient or poor-quality sleep are a contributing factor.

Effects of fatigue on driving

Regulating the hours of driving and off-duty time for heavy vehicle drivers is not enough by itself to eliminate the risk of fatigue-related accidents.

It is important to remember that fatigue becomes a problem when it compromises an individual's ability to perform tasks that require attention, judgment and sharp reflexes. Fatigue can:

- reduce your alertness, concentration and attention;
- alter your judgment and the quality of your decision-making;
- slow your reaction time;
- impair your memory;
- lead to drowsiness, microsleep periods and actually falling asleep at the wheel.

Learning to recognize the signs

The warning signs of fatigue should be taken seriously. You should stop immediately in a safe location to rest when the first signs appear.

The signs of fatigue vary from one individual to another, but it is essential you learn to recognize them:

- frequent yawning;
- itchy eyes or difficulty keeping your eyes open;
- nodding off;
- straying into the adjacent lane;
- being slow to brake;
- having difficulty keeping a constant speed;
- not remembering the last few kilometres travelled;
- missing an exit;
- being unable to find a comfortable position;
- feeling irritable;
- experiencing hallucinations;
- failing to check the side mirrors.

Three sets of factors affecting fatigue

Factors affecting fatigue can be related to:

- **you, the driver:** your state of health, especially whether you have a sleep disorder, the quality of your sleep, the type of individual you are (early bird or night owl), your age, emotional state, diet, level of physical fitness, family or personal life, whether you work one or more jobs, etc.;
- **your work environment:** frequent schedule changes, long hauls, interrupted schedules, night work, waiting times, the length of your work day, physical exertion, company policies with respect to managing fatigue, etc.;
- **your physical environment:** weather and road conditions, the availability of rest areas, the effects of noise, lighting and temperature in the cab, vehicle ergonomics, etc.

Aggravating factors

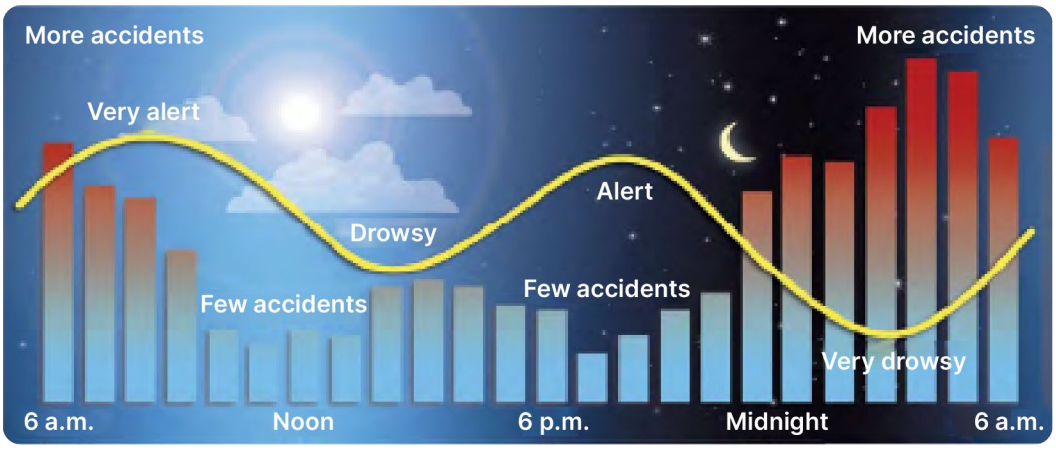
To effectively determine your exposure to fatigue, it is important to consider the following principal factors.

Time of day

The risk of falling asleep at the wheel is greatest early in the afternoon between 1:00 p.m. and 3:00 p.m. and at night between midnight and 6:00 a.m. The body follows a daily cycle that includes "down" periods during which metabolism slows down, alertness declines and fatigue sets in.

Number of hours without sleep

After 17 hours without sleep, your physical and mental performance declines rapidly, affecting your driving. After 17 to 19 hours without sleep, the effect of fatigue on your physical and mental capacities is equivalent to having a blood alcohol concentration of 0.05 (50 mg of alcohol per 100 ml of blood). After 24 hours without sleep, the effect of fatigue on your capacities is equivalent to having a blood alcohol concentration of 0.10 (100 mg of alcohol per 100 ml of blood).



Accumulated sleep debt

Regardless of age, if you do not get enough sleep, you build up a "sleep debt." Your performance may begin to suffer after even just a single night without enough sleep. Most adults need seven to nine hours of sleep each night to feel rested and alert.

The only way to remedy a sleep debt is to get enough sleep. And contrary to what some may think, your body does not eventually get used to functioning on less sleep. You should therefore avoid building up a sleep debt.

Sleep disorders

There are dozens of different sleep disorders. A person with a sleep disorder may feel abnormally tired and sleepy.

Obstructive sleep apnea is a chronic condition affecting at least 10% of the population. Even though it may have a very negative impact on a person's health and quality of life, a large percentage of those affected are unaware of their problem. The condition is characterized by a total or partial obstruction of the throat that recurs frequently during the night. The obstruction reduces the level of oxygen in the blood and disrupts the individual's sleep. This phenomenon can repeat itself hundreds of times in a single night. As a result, a person suffering from sleep apnea is unable to achieve a deep enough level of sleep to feel rested the next day.

The symptoms of sleep apnea are snoring, agitated sleep and frequently waking up during the night due to a feeling of suffocation. During the daytime, sufferers feel sleepy or tired, suffer from a shortage of energy and morning headaches, and have memory and attention problems. They do not feel rested in the morning. Certain illnesses, such as Type II diabetes, hypertension, depression and cardiovascular disease, can lead to sleep apnea. To find out how to treat this sleep disorder, you should see your doctor.

Consumption of alcohol, medications or drugs greatly amplifies the effects of fatigue and any sleep debt you may have accumulated.

Noise

Noise, which varies depending on the environment and the type of vehicle you are driving, is a factor that magnifies any fatigue you may already be experiencing. Noise may come from the engine, the tires, the exhaust system, the radio or the cab itself. A cab that is inadequately soundproofed, the vehicle's speed, and of course playing the radio at high volume, all add to the noise level and contribute to driver fatigue.

Recommendations for managing fatigue

AT HOME

- Seek the support of your family and make your sleep a priority.
- Plan enough free time to ensure restorative sleep.
- Ask family members not to disturb you when sleeping.
- Exercise regularly; even just 15 minutes of exercise a day is beneficial.
- Watch your diet: eat light low-fat meals and several servings of fruits and vegetables each day, with a low salt and sugar intake.
- Watch your caffeine and alcohol consumption.
- Take time out each day to relax and take steps to manage your level of stress.
- As a general rule, be aware of your sleep needs and make sleep a priority!
- See your doctor if you need help with sleep disorders.

ON THE ROAD

- Begin the work day well rested.
- Plan your route so that you can take advantage of as many opportunities to sleep and rest as possible. Ideally, you should take a break every two hours and a nap whenever necessary. Drinking coffee before or after your nap can help you stay alert for a short period (less than two hours).
- Whenever possible, avoid driving at night between midnight and 6:00 a.m. and during the day between 1:00 p.m. and 3:00 p.m.
- Slow down! Travelling at higher speeds requires you to process more information faster, which in the long term can lead to fatigue.
- Avoid visual fatigue while driving: dim the dashboard lights and remove objects that are reflected in the windshield.
- Assess your degree of fatigue and notify your dispatcher if necessary.

Respect your limits for the sake of your own safety and that of others! You cannot fight fatigue. Pay attention to the early warning signs and pull over to a safe location as soon as possible to rest.

For more information

To find out more:

- Fatigue Management Guide
- North American Fatigue Management Program

Inattentiveness

Drivers who are tired can make errors and cause serious accidents. You must therefore pay attention to the warning signs of fatigue that your body is sending you.

The inattentiveness that results when driving along roads that have monotonous surroundings and require little manoeuvring can lead to a condition referred to as “highway hypnosis” and can even cause you to fall asleep at the wheel.

Distractions

Distractions decrease a driver’s vigilance and performance. You must therefore avoid external distractions such as smoking, eating, drinking, using electronic devices, or any other activity that can turn your attention away from the road. A distracted driver is processing only half of the information available from the environment. They look, but do not see what is happening.

Speeding

Speeding and reckless driving are major causes of fatal accidents involving heavy vehicle drivers. Moreover, anyone who fails to obey the minimum and maximum speed limits faces penalties.

Speeding creates a series of conditions that can increase your stress and affect how you drive. Speeding has the following effects on driving:

- As you speed up, your field of vision gradually shrinks and your vision becomes very much like it would be if you were driving through a narrow tunnel. This is because of the increased speed at which objects are passing by you on either side of the vehicle.
- The distance travelled by the vehicle during the time it takes you to react to a situation increases.
- Braking distance increases.
- Your ability to make evasive manoeuvres declines.

Always bear in mind that you are driving a heavy vehicle, so it is important to drive responsibly at all times.

In large cities, traffic is often slow, so even if you are in a hurry to reach your destination, you must remain calm. You should also be extra careful and patient and use common sense, because in such a situation some road users may become aggressive and behave recklessly and dangerously.

Alcohol

Alcohol affects the brain and the central nervous system, which is the body's decision-making and coordination centre. As blood alcohol concentration increases, your ability to drive is gradually diminished.

Driving under the influence of alcohol:

- changes the quality of your visual perception;
- alters your judgment;
- slows your reaction time;
- reduces your resistance to fatigue;
- impairs your coordination.

Furthermore, people under the influence of alcohol often feel more self-confident, which leads to more risk-taking at the wheel and more dangerous driving. Even now, alcohol is still the cause of numerous fatalities and thousands of injuries on Québec's roads.

Under the *Criminal Code*, the legal limit is 80 mg of alcohol per 100 ml of blood (0.08). Penalties for driving while impaired by alcohol are increasingly severe with serious consequences. Even if your blood alcohol concentration is below the legal limit, your ability to drive is diminished when you drink alcohol. It is also important to understand that you can be arrested and convicted even if you have a blood alcohol concentration below 0.08, if there is enough evidence to establish that your ability to drive has been impaired as a result of alcohol, drugs or medication. Note that the rules regarding alcohol and driving are different and stricter when you are at the wheel of a heavy vehicle.

Certain folk remedies that supposedly reduce or eliminate the effects of alcohol are ineffective. Some people believe that eating at the same time they drink alcohol helps eliminate alcohol from their system. To a certain degree, eating may delay the absorption of alcohol into the bloodstream. It does not, however, prevent intoxication but merely slows the process. Regardless of your blood alcohol concentration, the liver eliminates 15 mg of alcohol an hour on average, which is equivalent to one beer, one glass of wine or one serving of spirits. The fact is, only time can eliminate alcohol from the bloodstream and mitigate its effects on driving.

Drugs and medications

Like alcohol, drugs and certain medications affect the brain and impair your ability to drive.

Drugs are classified according to their effects on the central nervous system (CNS). The three main categories of drugs are depressants, stimulants and CNS disrupters.

The effects of drugs can vary from one person to another and even from one occasion to another. Furthermore, the effect a drug produces depends on the characteristics of the individual, the product consumed and the context in which it was used.

While the use of illegal drugs is on the rise in Canada, the drug of choice is cannabis, which is a legal drug. Consumption of cannabis may have the following effects on your ability to drive a motor vehicle:

- difficulty concentrating and paying attention to the road environment;
- diminished perception of your surroundings;
- loss of coordination;
- difficulty driving in a straight line;
- difficulty driving at a constant speed and evaluating distances;
- slower reaction time, slower reflexes and hesitant driving;
- potential inability to cope with unexpected hazards.

Stimulants such as cocaine, speed and amphetamines give you a false sense of confidence and can lead to more risk-taking (speeding, aggressiveness). They also lead to drowsiness and a lack of concentration after the initial phase of euphoria has passed. It is therefore an error to believe that this type of drug can ward off fatigue.

Combining alcohol and drugs significantly increases the risk of being involved in a fatal traffic accident. This is an extremely dangerous practice that should be avoided at all costs.

Some prescription and over-the-counter medications can alter your ability to drive by diminishing your alertness, attention, vision or balance and by affecting behaviour. The following categories of medications can affect driving:

- sedatives;
- minor tranquilizers;
- pain medications;
- cough and cold medications;
- hypnotic drugs;
- diabetes medications.

You should consult a health care professional (physician, pharmacist) to find out how these medications will affect your ability to operate a vehicle, and you must always carefully read the instructions that come with prescription or over-the-counter medications.

For more information on impaired driving laws, visit justice.gc.ca/eng/cj-jp/sidl-rlcfa/index.html.

Prohibited levels

Alcohol and drugs

In Québec, you are prohibited from driving a heavy vehicle if you are impaired by alcohol or drugs. Moreover, if you drive a heavy vehicle with a blood alcohol concentration of 80 mg of alcohol per 100 ml of blood (0.08) or more, you are subject to the penalties and measures prescribed by the *Criminal Code* and the *Highway Safety Code*.

Zero-alcohol rule and certain vehicles

You are not authorized to drive or have the care or control of a bus, minibus or taxi if you have any alcohol or drugs in your bloodstream. If you violate this zero-alcohol rule, you will be prohibited from driving any such vehicle for 24 hours.

Blood alcohol concentration of 0.05 and certain vehicles

You are not authorized to drive or have the care or control of a heavy vehicle, tow truck or vehicle requiring the display of safety marks pursuant to the *Regulation respecting hazardous materials* if your blood alcohol concentration is equal to or more than 50 mg of alcohol per 100 ml of blood. This restriction does not apply, however, to a combination of vehicles formed by a passenger vehicle pulling a house trailer or tent trailer, or to a motor home. Note that certain heavy vehicles (buses) are subject to the zero-alcohol rule instead (see the above section).

Cannabis (THC)

There are two prohibited levels for THC, the primary psychoactive component of cannabis: it is a less serious offence to have between 2 ng and 5 ng of THC per ml of blood, and a more serious offence to have 5 ng of THC or more per ml of blood.

Combination of alcohol and cannabis

The prohibited levels of alcohol and cannabis, when found in combination, are 50 mg or more of alcohol per 100 ml of blood and 2.5 ng or more of THC per ml of blood.

Other drugs

Having any detectable amount of LSD, psilocybin, psilocin (“magic mushrooms”), ketamine, PCP, cocaine, methamphetamine or 6-mam (a metabolite of heroin) in your system within two hours of driving is also prohibited.

The prohibited level for GHB is 5 mg or more per litre of blood, since the body can naturally produce low levels of this drug.

Remember that alcohol or drugs and driving don’t mix!

Your behaviour at the wheel

As a professional driver of heavy vehicles, you have many responsibilities. Whether you are carrying cargo or people, you must adopt certain attitudes in order to accomplish the exacting and complex task of driving a heavy vehicle. Caution at the wheel starts by obeying traffic rules under *Highway Safety Code*. When driving on public roads, you must also exercise caution and show respect in the presence of more vulnerable people.

Keeping your cool

Professional drivers have a duty to stay calm, collected and cooperative in all situations.

If another road user, with or without provocation, is acting aggressively toward you, the best response is to avoid needless confrontation by staying calm and obeying the rules of the road. By reacting this way, you will force the other driver to realize that it is useless trying to provoke you.

Cooperating

Cooperation among drivers on the road is very important, regardless of the type of vehicle they drive. You can demonstrate a cooperative and courteous attitude through different actions. When you make driving easier for others, you avoid putting their lives at risk.

Sharing the road

The reality of heavy vehicle drivers is quite different from the reality of other road users. Pedestrians, cyclists and motorists are not always aware of the difference. Research shows that close to 70% of collisions involving heavy vehicles are caused by the inappropriate behaviour of another road user. Accidents involving heavy vehicles often have serious consequences, especially for pedestrians and cyclists, as they have no protection if they are struck by one of these vehicles.

Observing the duty of care

According to the duty of care, added to the *Highway Safety Code* in 2018, all road users must be careful and considerate when travelling on public roads, especially toward more vulnerable road users.

Pedestrians, cyclists and heavy vehicle drivers all have a role to play and must adopt behaviours that enhance their own safety. If everybody becomes more alert and more aware of the types of behaviour that can put them at risk, the number of accidents will be reduced and lives could be saved.

While heavy vehicle drivers are generally careful and attentive, they cannot stop others from coming too near their vehicles and entering one of their blind spots.

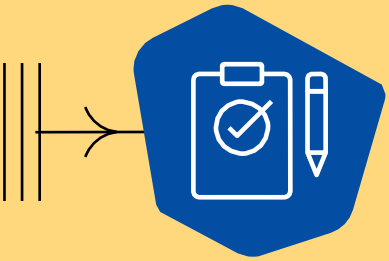
Here are a few road-sharing behaviours that you should adopt as a heavy vehicle driver:

- Be mindful of people around your vehicle, especially at urban intersections.
- Watch and anticipate the movements of pedestrians and cyclists.
- Never assume that your intentions and manoeuvres are predictable for other road users.
  - This is the case, for example, when turning right at an intersection, especially if you must encroach on the adjacent lane or shoulder.
- Make sure your side mirrors are clear, in good condition and properly adjusted.
- Keep your headlights on at all times.
- Use your turn signal lights to indicate your intention to turn or change lanes.

The road is a public place where many types of road users travel. It is in everyone's best interest to share the road safely and harmoniously.

EXAMPLES OF COOPERATIVE BEHAVIOUR:

- **Adjusting your speed to allow another driver to pull over into your lane more easily.**
- **Using the right lane and reserving the left lane for passing.**



Exercise 4.5

Choose the correct answer.

1. What are the principal causes of accidents on Québec roads?

- ◯ **A)** Faulty brakes
- ◯ **B)** Damaged roads
- ◯ **C)** Speeding, alcohol, distraction and fatigue
- ◯ **D)** Snow-covered roads

2. If you are tired or are experiencing fatigue while driving, you should:

- ◯ **A)** pull over and stop in a safe location to rest.
- ◯ **B)** turn up the volume of the radio.
- ◯ **C)** open the window to let in some fresh air.

3. What should you do to prepare for a long trip?

- ◯ **A)** Get a good night's sleep before leaving and allow time for rest stops and naps when planning your route.
- ◯ **B)** Leave in the evening and drive at night to avoid traffic.
- ◯ **C)** Try to drive for as long as possible while you are feeling alert in order to get to your destination as soon as possible.

4. After how many hours of being awake is the effect of fatigue on driving comparable to having a blood alcohol concentration of 0.05?

- ◯ **A)** 10 hours
- ◯ **B)** 14 hours
- ◯ **C)** 17 hours

5. Does drinking only one glass of alcohol affect your ability to drive?

- ◯ **A)** Not at all
- ◯ **B)** Slightly
- ◯ **C)** Significantly

6. When are periods of drowsiness while at the wheel more frequent?

- ◯ **A)** In the early afternoon and at night
- ◯ **B)** In the morning
- ◯ **C)** After supper

7. Most people require seven to nine hours of sleep each night. After how many nights without enough sleep do you accumulate a sleep debt?

- ◯ **A)** One
- ◯ **B)** Two
- ◯ **C)** No particular number of nights, because missing sleep has no effect on driving

8. In your opinion, during what period of the day is there the lowest risk of fatigue-related accidents?

- ◯ **A)** In the morning between 8:00 a.m. and noon
- ◯ **B)** In the afternoon between 1:00 p.m. and 3:00 p.m.
- ◯ **C)** At night between midnight and 6:00 a.m.

9. To perform most efficiently, how many hours should a driver under age 25 sleep?

- ◯ **A)** The same number of hours as an older driver
- ◯ **B)** Fewer hours than an older driver
- ◯ **C)** More hours than an older driver

10. What should you do if you begin to experience fatigue while driving?

- ◯ **A)** Ignore the first signs of fatigue
- ◯ **B)** Acknowledge the signs of fatigue, but keep driving
- ◯ **C)** Pull over and rest

The answer key is provided at the end of this guide.

Driving in Difficult Conditions

Driving at night

Although many professional drivers are used to driving at night, this is still a very difficult and demanding task. You need to pay extra close attention to the road. As we have already noted, driving at night is a factor that contributes to problems of fatigue.

At night, for the sake of your safety, it is strongly recommended that you drive more slowly than the speed limit. The faster you drive, the narrower your field of vision. If an unexpected hazard arises, your reduced field of vision can have a major impact on how long it takes you to perceive what is happening, make a decision and react. You should therefore make sure your stopping distance is within the range of your headlights.

For example, with your low beams, you can see up to about 75 m ahead of your vehicle and with your high beams you can see up to 150 m ahead. If you are moving too fast, you do not have enough time to avoid any obstacles beyond this range.

In addition to having a reduced field of vision, at night your visual acuity and your ability to make out contrasts, discriminate between colours and perceive depth are also affected. Objects are hard to see because they blend in with the darkness, so it is hard to evaluate distance and speed at night. To make up for this, it is important to reduce your speed. As well as slowing down, you should look beyond the area covered by your headlights so that you can detect the presence of a pedestrian or an obstacle with enough time to react.

Glare is a major problem when driving at night. Glare from lights can impair your vision for several seconds at a time. This means that you can cover a fair distance before your eyes completely readjust to the dark. Be extra cautious when meeting oncoming vehicles. Also, make sure you never wear glasses that are even slightly tinted at night because they reduce visibility.

HOW TO AVOID GLARE WHEN DRIVING AT NIGHT

- Limit the sources of light from your dashboard and adjust them as low as possible because they can cause distraction and fatigue.
- Avoid looking directly at the headlights of other vehicles. Instead, you should look towards the right side of the road when you meet another vehicle.
- If you are being blinded by glare from the headlights of oncoming vehicles, slow down and let your eyes become accustomed to the dark again before resuming your speed.
- Flip your headlights back on high beams immediately after passing an oncoming vehicle, because this is when you need the strongest light.
- If other drivers keep their high beams on and they are blinding you, click your own high beams on then off again. If the driver still does not switch to low beams, do not insist. Slow down, stay as close to the right side of the lane as possible and look off to the right side of the road. If you need to, pull over onto the shoulder and stop for a few minutes.

At night, being seen by others is just as important as being able to see. Make sure your vehicle's lights are clean and in good working order.

Also, it is important to keep your mirrors and windshield clean, both inside and out. This way, your field of vision will be unrestricted and any negative effects from lights will be kept to a minimum. This is even more important in bad weather.

Rain or shine

Driving can be dangerous even when the weather is fine. You can be lulled into a false sense of security and let down your guard. Blinding sunlight, for example, can become a major hazard, so be careful!

When it begins to rain and the water on the road surface mixes with dust, sand, oil and other fluids from vehicles, the pavement becomes slippery. Slow down so that you will not have to steer or brake abruptly.

At dawn and dusk, in rain, snow, freezing rain or fog, it is hard to see other vehicles and hard for them to see you. Turn on your headlights to be sure you are visible to other road users. Your parking and tail lights are not sufficient for others to see you clearly.

If your field of vision is reduced by snow or freezing rain on the windshield, turn on your windshield wipers and, if necessary, pull over somewhere where you can clean your windshield, windows and side mirrors and clear the ice or snow off your wipers.

In winter, when the road is snow-covered or slippery or when visibility is reduced, braking and steering are much more difficult. You must slow down. If visibility is nil, pull over somewhere safe as soon as possible to avoid colliding with other vehicles or going off the road.

Driving in winter poses special challenges, such as icy patches or black ice. Winter conditions often mean less traction. **Slow down!** Loss of traction affects your vehicle's acceleration, braking and handling.

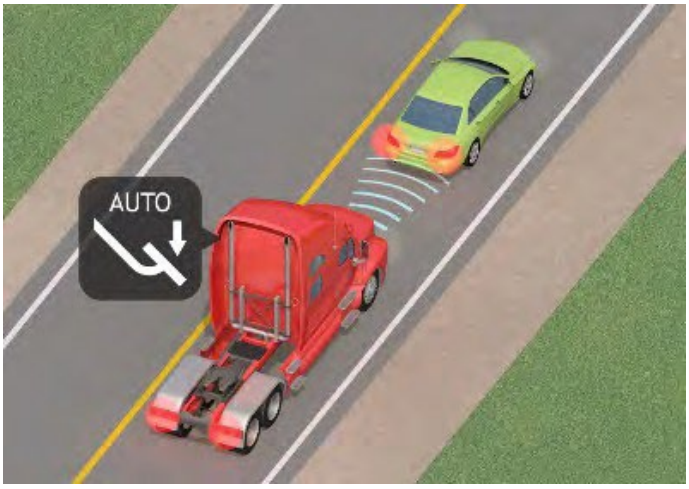
Car drivers sometimes tend to follow too closely behind heavy vehicles. They are usually not aware that the heavy vehicle driver they are following is unable to see them. So be especially careful when braking.

BRIDGES AND OVERPASSES

It is important to remember that road surfaces on bridges and overpasses can become especially slippery and dangerous when the temperature is around the freezing point. Because of condensation, an invisible sheet of ice, referred to as "black ice," may form on the roadway.

Certain Features of Your Vehicle and Their Impact on Your Driving

Advanced driver assistance systems



Over the years, advanced driver assistance systems developed in the automotive industry have gradually crossed over to the trucking industry (for more information, see Chapter 2). Some of these systems are well known, such as anti-lock braking and electronic stability control. Other systems are less well known, such as collision avoidance and adaptive and predictive cruise control.

The goal of advanced driver assistance systems is primarily to make roads safer for all road users by reducing the risk of accidents and limiting the damage in unpreventable accidents. These systems help with the driving task, mainly in combination with an automatic transmission.

Nevertheless, in order to fully take advantage of advanced driver assistance systems, you must have a good understanding of how they work. You also need to keep in mind that these systems only assist with the task of driving. They cannot replace a vigilant driver.

Vehicle size and weight

A vehicle's size and total loaded mass may affect your driving, speed and stopping distance. You will have to take these factors into consideration so as to be ready to react to unexpected hazards as they arise.

As was explained at the beginning of this chapter, you must bear in mind the size of your vehicle when turning or going through an intersection so as to allow enough space and not cause problems for other road users.

In addition, the load you are carrying has an impact on your vehicle's stability, accelerating power and stopping distance. You must therefore leave enough space between your vehicle and other vehicles when entering the stream of traffic, changing lanes, passing other vehicles or stopping.

Considering the importance of all these factors, it is only natural that you, the driver, should share responsibility with the operator for complying with the provisions of the *Vehicle Load and Size Limits Regulation* applicable to road vehicles and combinations of road vehicles.

Condition of the tires

Heat affects different vehicle components. For instance, it causes tires to wear out more quickly. The internal temperature of a tire can rise very high, making the rubber less resistant to cuts and tears and increasing the risk of a flat.

The tires merit special attention because they are a very important component of your vehicle. They have to bear the vehicle's weight, absorb shocks resulting from rough road surfaces, and perform well when you are accelerating, turning and braking, winter or summer, day in and day out.

In summer, pay close attention to the tire treads because they tend to crack or become unstuck in intense heat. Heat also increases tire pressure, but do not let any air out of them because the pressure will then be too low once the tire has cooled down. If any of the tires feel very hot to the touch, you should wait a while and let them cool down before driving again. Otherwise, the tire could have a blowout or catch fire.

For your own safety and that of others, be sure to check the tires when doing your circle check. If the weather is very hot, check them even more frequently. Other inspections must be completed at different times.

Checking fluids in hot weather

During hot weather, you should also regularly check:

- the engine oil pressure gauge;
- the engine coolant temperature gauge;
- the transmission fluid temperature gauge;
- the differential fluid temperature gauge.

Getting your vehicle ready for winter

Extreme cold and sharp changes in temperature can affect your vehicle's performance if it is not maintained properly. Extra precautions should be taken to keep your vehicle running perfectly at all times.

Your vehicle requires certain special equipment in winter (such as a snow shovel and booster cables) and some of its components have to be adjusted for the season (such as tires, windshield wipers and lubricants). Although the vehicle's owner is the one primarily responsible for preparing it for winter, make sure it is safe and ready for the season before taking it out on the road for the sake of your own safety and that of others.

Braking power

It takes a lot of braking power to stop a heavy vehicle. It also takes more space to bring a heavy vehicle to a stop than it does a passenger vehicle, and even more so at high speed.

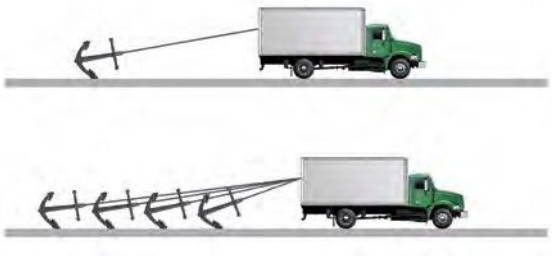
There are two factors that influence the braking power needed to slow down a vehicle or bring it to a stop: the vehicle's weight and the speed at which you are driving.

Brake systems are usually designed to be efficient as long as the vehicle does not exceed its gross vehicle weight rating (GVWR). This is the maximum weight recommended by the manufacturer and represents the weight of the vehicle plus the weight of the load. If a loaded vehicle weighs more than its GVWR, the brakes may not perform optimally and will wear out more quickly.

In theoretical terms, if the load you are carrying results in a total weight that is double the weight of your vehicle alone, the stopping or braking distance is also doubled, provided the same amount of air pressure is applied on the brakes.

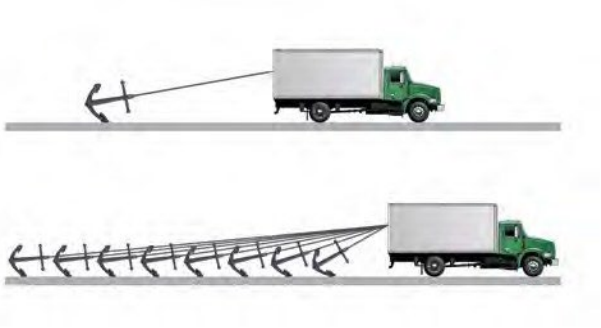
By doubling the pressure on the brakes, you can stop within the same distance, but the brakes will heat up twice as much. To minimize overheating, you can either decrease your speed or increase the stopping distance. It is very important to never go over the vehicle's GVWR: if you do, the brakes could fail completely.

The other important factor is speed. It is even more important than weight or load because the braking power required is proportionate to the square of the increase in speed.



In other words, when you double your speed, the braking power required is quadrupled. You therefore have to provide four times more braking power to maintain the same braking distance. In turn, the brakes generate four times more heat. This is why you need to remain aware of the speed you are driving at.

Now that you understand the impact of weight and speed on braking, you can gauge the power required of your brakes to bring your vehicle to a stop. For example, if both your vehicle's weight and its speed are doubled, it will take eight times more braking power to immobilize it.



To keep your brakes working efficiently, you must maintain them in good condition and be careful not to push them beyond the capacity of the brake linings, the drums or the discs. Excessive braking can produce more heat than the drums and discs can absorb and disperse. The excess heat created by friction between the linings and the drums or discs causes the linings (or the brake) to become glazed and lose their effectiveness. This problem disappears when the linings cool down.

It is important to understand that brake system performance does not depend on brake power alone. Other factors have an impact, such as brake adjustment, the kind of brake linings used and their condition, what shape the tires are in, the slope of the road, the condition of its surface, and how aerodynamic the vehicle is.

Factors that influence braking distance

As a heavy vehicle driver, you must be aware of the various factors that can affect how you should drive your vehicle. For example, to slow down or come to a stop, you have to adjust your driving based on the following factors:

Weight of the load

The load you are carrying has an impact on braking distance. This means that if the weight of your load is doubled and you apply the same brake pressure, it will take you a greater distance to come to a stop. Heavy vehicle brake systems are designed to be effective on loaded vehicles as long as the total weight of the loaded vehicle does not exceed the manufacturer's GVWR

Vehicle speed

By slowing down by just a few kilometres an hour, you can greatly reduce your stopping distance.

Perception time, and human and machine reaction time

The estimated time lag between when you see a danger and when the brakes begin to slow the vehicle is two seconds. You must factor in this delay in order to brake safely.

Road conditions

In most cases, you have some control over factors such as load and speed, but road or pavement conditions are beyond your control and can reduce the traction you need to maintain control of your vehicle when braking. In such a situation, the only way you can be sure of coming to a stop within normal braking distance is by reducing your speed. Braking distance is at least doubled on icy pavement as compared to dry pavement. For example, at 60 km/h, it takes approximately 45 m (140 ft) to come to a complete stop on dry pavement and 80 m (260 ft) on icy pavement.

So slow down—to below the posted speed limit—and avoid braking abruptly.

Brake adjustment

For a heavy vehicle's brakes to work properly, it is not enough just to check that they are in good condition. They also have to be adjusted properly to ensure that maximum pressure is exerted by the brake linings on the drums or discs at all times.

Conversely, any type of brake—service brake, parking brake, emergency brake—that is poorly adjusted will never work efficiently. In a drum brake, for example, the pressure exerted by the brake linings against the drum will be insufficient if there is too much space between the linings and the drum, even if the gauges show adequate air pressure in the brake system.

This is why the space, or clearance, between the brake linings and drum must always be just right. However, the brake drum expands at high temperature; just how much it expands depends on what alloy it is made from. Also, it can wear out under pressure from the linings and become stretched or twisted, which increases the clearance between the linings and the drum.

The push rod must be able to bridge the gap so that the linings continue to press against the drum with all the pressure that the brake system supplies. It is essential to regularly check the brake adjustment, even if you have automatic self-adjusting brake levers.

Automatic self-adjusting brake levers

When a vehicle is equipped with automatic self-adjusting brake levers, this mechanism automatically compensates for any play between the brake linings and drums as the linings wear down.

Preventive adjustment procedure

There is a simple procedure you can use to optimize the play or space between the linings and drums:

1. Make sure the brakes are cold.
2. Release the parking brake.
3. Bring the system up to maximum air pressure (120 psi or 827 kPa).
4. Fully depress the brake pedal for five seconds and then release it completely.

Repeat this procedure four or five times in a row to complete the adjustment.

Although not mandatory, you can incorporate this adjustment into your circle check when you check the pressure regulator once the compressor comes on. If this procedure is not carried out on a regular basis, you should probably repeat Step 4 more than five times for maximum play compensation.

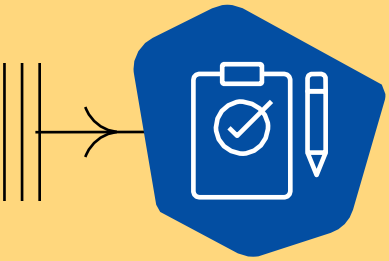
Manual brake levers

If your vehicle is not equipped with automatic self-adjusting brake levers, you will have to adjust the brakes manually. However, brake adjustment is a complex task that should be done only by mechanics or by drivers who have received specialized training.

Driving an unfamiliar vehicle

You need to consider the risks involved when driving a vehicle that is different from the one you are used to. You must take into account the vehicle's size, trailer, load, braking power, engine power and certain types of systems. All these factors have a significant impact on driving the vehicle.

You must take time to become familiar with your new work environment, including the dashboard indicators and various controls. You also need to adjust your seat and the side mirrors.

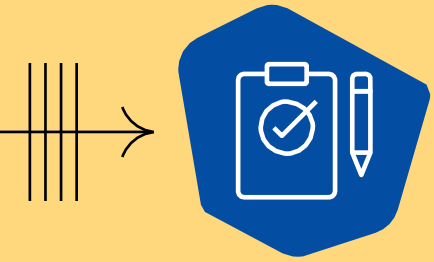


Exercise 4.6

Indicate whether each of the following statements is true or false.

Statements	True	False
1. When driving at night, you must make sure that the distance you need to come to a full stop is within the area lit by your headlights.	◯	◯
2. The only one responsible for complying with vehicle size and load limits is the operator.	◯	◯
3. Using your parking and tail lights to signal your presence to other road users is sufficient when visibility is reduced.	◯	◯
4. It is a good idea to check the condition of your tires more frequently in very hot weather.	◯	◯
5. Doubling the speed of a heavy vehicle has a much greater impact on braking distance than doubling its weight.	◯	◯

The answer key is provided at the end of this guide.



Exercise 4.7

Choose the correct answer.

1. When is the risk of an accident the highest?

- **A)** Between 6:00 p.m. and 8:00 p.m.
- **B)** Between 1:00 p.m. and 3:00 p.m.
- **C)** Between 6:00 a.m. and 8:00 a.m.
- **D)** Between 10:00 a.m. and noon

2. When driving a vehicle measuring 15 m long, what is considered a safe distance (in seconds) between your vehicle and the one ahead of you?

- **A)** 3 seconds
- **B)** 5 seconds
- **C)** 7 seconds
- **D)** 15 seconds

3. Which vehicles must stop when the lights on the road sign indicating an SAAQ weigh station are flashing?

- **A)** All heavy vehicles
- **B)** Only semi-trailer trucks
- **C)** Only loaded heavy vehicles
- **D)** All heavy vehicles with a GVWR of 4,500 kg or more

4. Your truck broke down on a limited-access highway. Where should you place the triangle reflectors?

- **A)** One triangle 30 m ahead of the vehicle, one 3 m behind the vehicle, and another one 30 m behind the vehicle, all three aligned with the left side of the vehicle
- **B)** All three triangle reflectors behind the vehicle and aligned with its left side at 3 m, 30 m and 60 m
- **C)** One triangle 3 m ahead of the vehicle and the other two at 3 m and 30 m behind the vehicle, all three aligned with the left side of the vehicle
- **D)** All three triangle reflectors behind the vehicle and aligned with its left side at 30 m, 60 m and 90 m

5. What does looking far ahead mean when driving on a limited-access highway?

- **A)** You need to scan the distance you will be covering in the next four to five seconds.
- **B)** You need to scan the distance you will be covering in approximately three vehicle lengths.
- **C)** You need to scan the distance you will be covering in the next 12 to 15 seconds.
- **D)** You need to look as far as the distance you will be covering to meet up with the vehicle ahead of you.

6. What is the best way to negotiate a sharp curve with a loaded semi-trailer truck?

- **A)** Brake in the curve to slow down.
- **B)** Choose a gear that will enable you to accelerate slightly once you are in the curve to keep your vehicle stable.
- **C)** Choose an appropriate gear to slow down in the curve.
- **D)** Brake and downshift to slow down in the curve.

7. You need to back up your semi-trailer truck toward the left. Which one of these statements is true?

- **A)** When backing up, it is important to open the driver's side door to have a better field of vision.
- **B)** When backing up, you can only check your left side mirror.
- **C)** When backing up, you especially need to check out the rear window.
- **D)** When backing up, you need to check both side mirrors.

8. In order to pull over and stop a heavy vehicle on flat terrain, what do you need to do?

- **A)** Brake and downshift to use engine compression.
- **B)** Brake but do not downshift.
- **C)** Above all use the engine brakes.
- **D)** Only use the engine brakes and the service brakes.

9. What does this road sign mean?

- **A)** There is a slope with a 60% gradient ahead (60 m vertical drop for every 100 m travelled). The higher the percentage, the steeper the gradient.
- **B)** There is a slope with a 6% gradient ahead (6 m vertical drop for every 100 m travelled).
- **C)** There is a slope with a 6-degree gradient ahead.

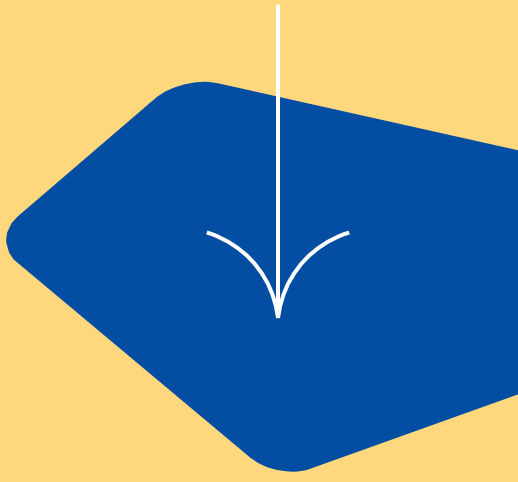
10. What does this road sign mean?

- **A)** Trucks can go 12% faster than the posted speed limit for 3 km.
- **B)** You do not need to worry. This sign is only for Class 3 trucks.
- **C)** Trucks need to reduce their speed by 12% for 3 km.
- **D)** You are approaching a slope with a 12% gradient over a total distance of 3 km.

The answer key is provided at the end of this guide.

Chapter 5

5 Air (Pneumatic) Brake Systems



In this chapter, we will be dealing with full air brake systems only. Also, we will describe only the type of modern multi-circuit air brake system that is connected to all the vehicle's wheels. You should note, however, that even though they operate on the same principles, brake systems vary slightly from one manufacturer to another and from one type of vehicle to another (depending on what the vehicle is used for).

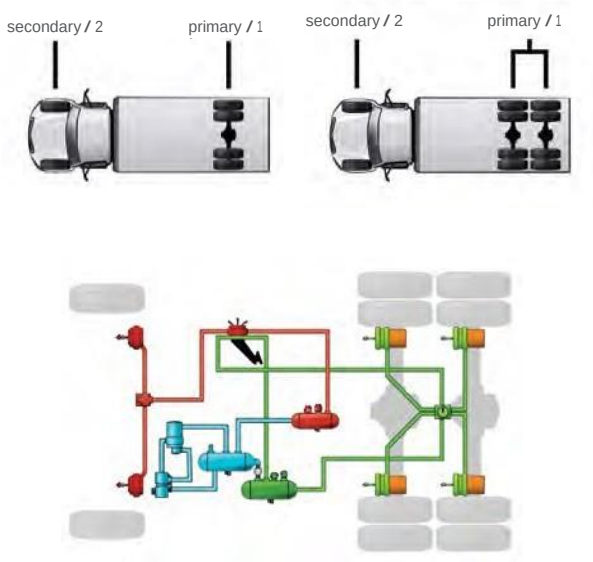
All brake systems include service brakes, parking brakes and emergency brakes. If you are familiar with the basics of how brake systems work, you will have a better chance of obtaining the maximum braking power in all situations. You should check your brakes frequently and know how to operate them properly.

The Most Popular Brake System

Air brakes have become increasingly popular as heavy vehicles have increased in size and load capacity.

Today, almost all heavy vehicles are equipped with air brakes. Air brake systems have changed and improved over the years, however. They offer many advantages:

- They are usually more powerful than hydraulic systems.
- They have proven their reliability.
- It is easy to connect other vehicles and other air-powered equipment to them. For example, compressed air is used for the suspension and certain other equipment.



Air brake systems are basically made up of a compressed air supply circuit and two circuits, the primary circuit (P or 1) and the secondary circuit (S or 2), that serve to activate the service brakes on all of the vehicle's wheels. The primary and secondary circuits may be installed differently from one vehicle to another. They work independently, so that if one of them fails, the other one continues to operate normally.

Controls and Components

Driver's cab

Brake pedal

This pedal is used to activate the service brakes on all of the vehicle's wheels, including the wheels of the trailer or semi-trailer. By pressing down on the brake pedal, you allow the compressed air in the service reservoirs to flow into the brake chambers.

The more pressure you apply to the pedal, the greater the amount of air that enters the brake chambers. However, the amount of pressure required may vary from one vehicle to another and is affected by the vehicle's load. With practice and experience, you will find out just how much pressure you have to apply to slow your vehicle down or bring it to a stop with no risk of causing the wheels to lock up.

Semi-trailer hand brake control

This hand brake control is used to apply the service brakes, but only on the semi-trailer's wheels. By pulling up on this lever (or pushing down on it, on some models), you send compressed air from the service reservoirs to the brake chambers of the semi-trailer's wheels.

The hand brake is either attached to the steering column or installed on the dashboard. It is sometimes used by drivers to check whether the semi-trailer is properly hitched. After completing the hitching operation, it can also be used to check whether the service brakes for the trailer or semi-trailer are working properly.

The hand brake should never be used as a parking brake or, when on the road, as a service brake. Using the semi-trailer hand brake as a service brake while on the road is definitely a less effective way of slowing your vehicle than using the service brake for the entire vehicle combination, which is activated by the brake pedal. If you use the hand brake as a service brake, the braking effect will not be equally distributed over all the wheels in the vehicle combination: the brakes on the semi-trailer will produce much more heat and could even overheat, rendering them less effective. Also, using the hand brake as a service brake could cause the vehicle to skid on icy surfaces.

Parking brake control

The parking brake control is the yellow diamond-shaped knob located on the dashboard. When you pull on it, air is released from the vehicle's brake chambers. Once the chambers are empty, powerful springs are activated and the wheels that are equipped with a parking brake are clamped into place.

The parking brake control is used to hold your vehicle stationary. You must pull on the knob before getting out of the cab. In the case of tractor semi-trailers, this control allows you to apply the parking brakes on both the tractor and the semi-trailer. More details on using the parking brake will be provided later on in this chapter.

Before you start driving your vehicle, you need to push the parking brake control knob in so as to release the parking brakes. This allows the compressed air in the reservoirs to fill the brake chambers so that the springs are compressed and the wheels unclamped.

Trailer air supply control

Your service brakes will not work properly unless the compressed air reservoirs are adequately filled.

To send air to the trailer or the semi-trailer service reservoirs, you must use the octagonal-shaped red knob located on the dashboard. This knob (as well as the parking brake knob) is always the same colour and shape in all vehicles. Pushing the knob in activates a valve that allows compressed air to flow to the trailer or semi-trailer brakes.

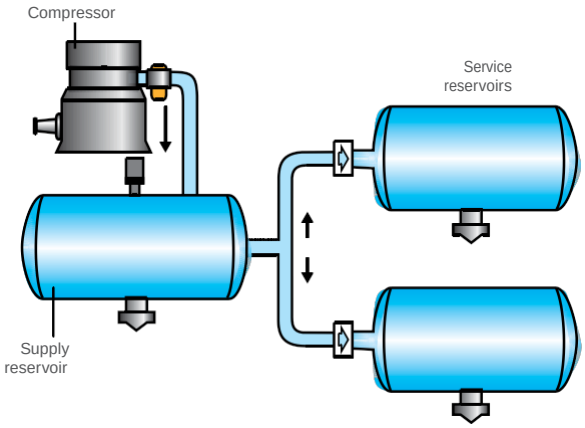
The trailer air supply control is also used to apply or release the parking brakes of the trailer or semi-trailer. Pulling on the knob closes the air-flow valve. This releases air from the brake chambers of the trailer or semi-trailer so the parking brake can be applied to all the corresponding wheels. Among other things, this enables you to immobilize a trailer or semi-trailer before unhitching it.

Other parts of the vehicle

Compressed air reservoirs

Compressed air is sent through the lines and stored in reservoirs. The compressed air provides the power required to activate the service brake and release the parking brake. When you press the brake pedal, the service brake exerts pressure on each of the vehicle's wheels.

Heavy vehicles have at least three compressed air reservoirs. The first one, referred to as the "supply reservoir," receives air directly from a compressor and sends it on to the other two reservoirs. These other reservoirs, referred to as "service reservoirs," supply air to the brake chambers near the wheels.



Trailers and semi-trailers have their own compressed air reservoirs that are supplied by the service reservoirs of the truck or tractor.

The reservoirs store enough air to make the brakes work. If the compressor fails, the service brakes will still work for a while. However, depending on how you use your brakes, how much air is used by accessories and other components (such as the air suspension system), and how air-tight the system is, the compressed air supply may run out very quickly. If this happens, you will be warned of the seriousness of the situation by the low air pressure indicator and the emergency brake will be activated. As soon as you see the warning signal, you should pull over and have the necessary repairs done.

Some vehicles, buses for example, are equipped with an additional compressed air reservoir that is useful in an emergency. If the service brakes fail and the emergency brakes are activated, the additional air supplied by this reservoir can be used to immediately move the vehicle just a few metres farther on from the point where it came to a stop.

Emptying reservoirs

It is essential for the air to be clean if the brake system is to perform well. Impurities can build up inside the reservoirs because of changes in temperature and environmental conditions. To eliminate them, the reservoirs need to be emptied completely, or "bled," every day. You do this by fully opening the air bleed valve that is provided with each reservoir. In winter, you should bleed the reservoirs after operating your vehicle while it is still warm to avoid the risk of the valves freezing up and remaining stuck in the open position.

Most heavy vehicles nowadays are equipped with an air purifier (also referred to as an "air dryer" or "air filter"). The air purifier is located between the air compressor and the supply reservoir. It filters and dries the air and eliminates impurities. You must still bleed the reservoirs, however, even if your vehicle is equipped with such a device.

Air compressor and pressure regulator

The air compressor draws in and stores air from the outside, compresses its volume and then sends the compressed air into the supply reservoir.

The compressor is driven by the vehicle's engine, so it operates only when required and when the engine is running. Some systems operate at different levels, but they always maintain a spread of 138 kPa (20 psi). For example, the air compressor generally begins operating when the air pressure in the service reservoirs drops below 724 kPa (105 psi). It stops filling the reservoirs when the pressure reaches 862 kPa (125 psi). Most air brake systems function within these limits.

The pressure regulator manages the operation of the air compressor by maintaining the pressure in the service reservoirs. The pressure regulator starts the air compressor before the air pressure in the reservoirs drops to 550 kPa (80 psi) and stops it when air pressure rises to between 805 kPa (117 psi) and 945 kPa (137 psi). Refer to Chapter 6 on the circle check for information on malfunctions affecting the pressure regulator.

The truck's or the tractor's compressor also fills the reservoirs of any trailers or semi-trailers via the service reservoirs of the truck or tractor.

How the air supply line works (blue)

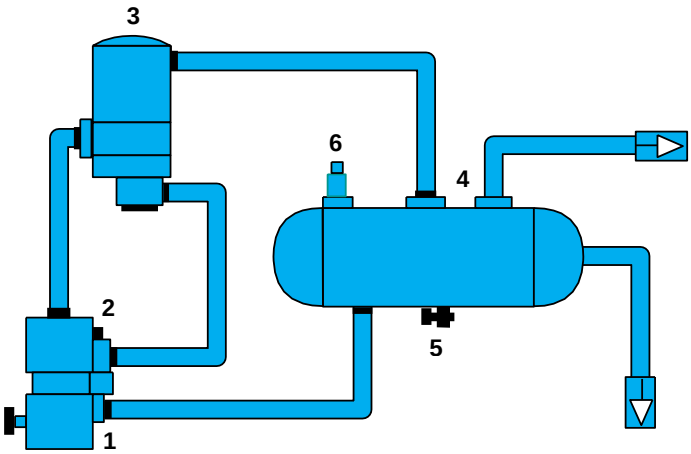
Compressed air goes from the air compressor (1) to the air purifier (3). It is then sent to the supply reservoir (4), where it is stored (with its power) until it is used.

The air compressor (1) compresses or stops compressing based on the signals sent by the pressure regulator (2).

The air purifier (3) evacuates moisture and dirt that accumulates during the air compressor's resting phase.

A pre-set air bleed valve (5) and a protection valve (6) are also part of the air supply circuit.

1. Air compressor
2. Pressure regulator
3. Air purifier
4. Supply reservoir
5. Air bleed valve
6. Protection valve



Exercise 5.1

In the box below, draw the air supply line for the braking system as accurately as possible and label the following: air compressor, air purifier, pressure regulator, air lines, supply reservoir, air bleed valve and protection valve. Draw arrows to indicate which direction the air flows.

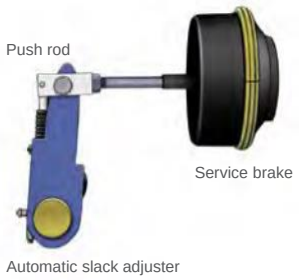
Brake chambers

There is a brake chamber near each of the vehicle's wheels. When you activate the service brakes, air flows through the lines from the service reservoirs to these chambers. When the air enters the chamber, it pushes on a membrane—the diaphragm—that is attached to a push rod. In the case of a drum brake, for example, when the push rod moves, it operates a slack adjuster that drives a camshaft. The movement of the S-cam makes the brakes clamp.

There are two kinds of brake chambers. The first is a single chamber (service brake), and the second is a double chamber (service brake and parking brake).

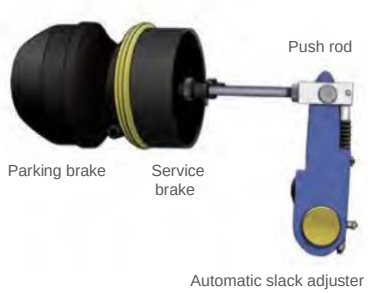
A service brake is installed on each of the wheels. When you apply the brake pedal, it allows the air in the service reservoirs to flow into the brake chambers and activate the service brake. Unlike a hydraulic brake system, in an air brake system braking power is supplied by the pressure exerted by compressed air, rather than by your own muscle strength.

Single brake chamber



As for parking brakes, they are mounted only on the rear wheels of the tractor, truck or bus (these vehicles must be equipped with double brake chambers on at least one axle). Parking brakes are also found on the trailer or semi-trailer wheels (except for the wheels on most auxiliary lift axles). A parking brake is therefore always paired with a service brake.

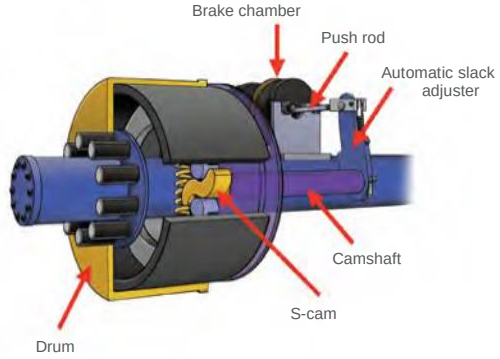
Double brake chamber

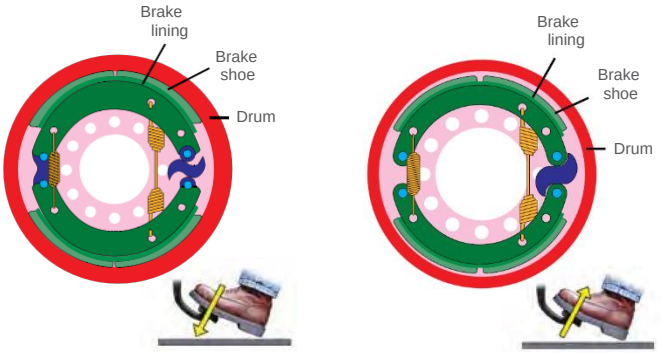


The parking brake is equipped with a powerful spring that allows the brake to be applied mechanically when the vehicle is parked and that also activates the emergency brake if a problem arises. When you pull on the parking brake knob, this empties the air from the parking brake part of the double brake chamber. The springs relax and this activates the parking brake. When you push on the parking brake knob, just the opposite happens: air flows into the parking brake part of the double brake chamber, compresses the springs and disengages the wheels, which are then free to turn.

Drum brakes

A drum brake system is made up of brake shoes equipped with linings that press on the inside surface of a drum mounted on the wheel. When you press the brake pedal, two brake shoes covered with linings press against the drum and this pressure causes the vehicle to slow down or stop.





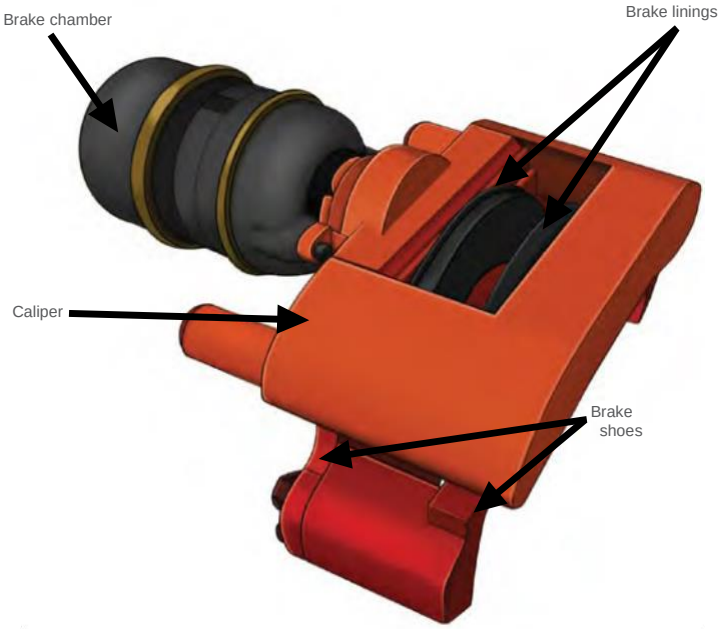
Drum brakes—more specifically S-cam brakes—are the most common kind of brake found on heavy vehicles. The name is derived from the fact that an S-shaped cam is used to pull the brake shoes apart.

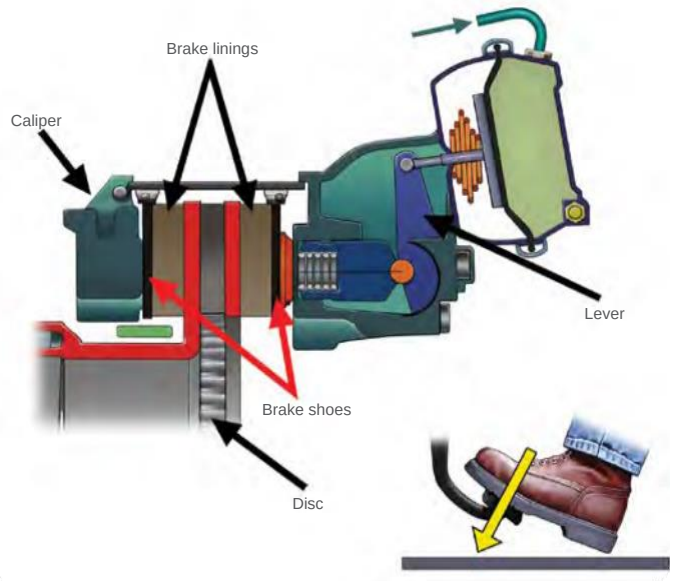
When you apply the brakes and when the slack adjuster is properly adjusted, the friction of the brake linings against the drum produces a great deal of heat. Brake linings lose their effectiveness if they become overheated through misuse or overuse. Refer to Chapter 4 to find out about certain techniques you can use to slow your vehicle without compromising the efficiency of the brakes and without overheating them.

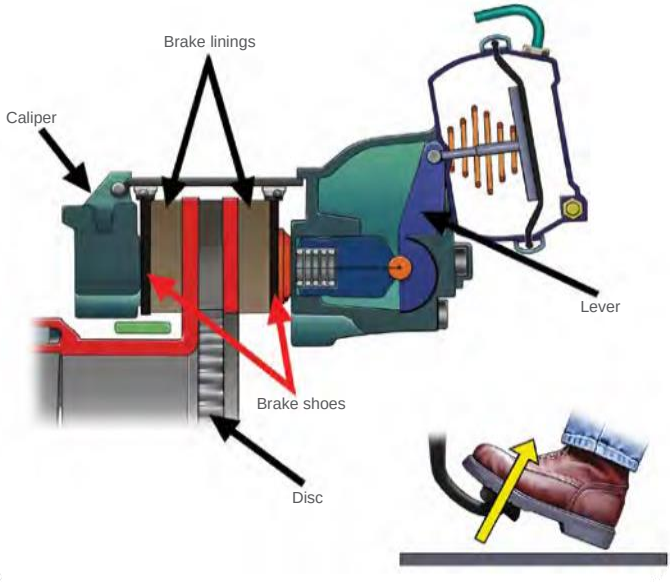
Disc brakes

A disc brake is made up of a disc installed on the hub and brake linings (or “pads”) that are held in place by a caliper attached to the vehicle and that rub against the disc on both sides. When you press down on the brake pedal, the caliper pushes the brake pads against the disc and slows the vehicle or brings it to a stop.

Disc brakes are the most frequently used type of brakes in motor coaches and are being used more and more in other types of heavy vehicles. In contrast to drum brakes, disc brakes consume less air (because the brake chamber is smaller) and their braking efficiency is less likely to be impaired at high temperatures.







Trailer air lines

Air lines are tubes that allow compressed air to flow between adjacent vehicles and supply the brake lines of the trailer or semi-trailer. In general, red air lines are used to supply air to the brake chambers for the service brakes (via the service reservoir) and to release the parking brake, and blue air lines are used to supply air to activate the relay valve of the trailer or semi-trailer, which allows air to flow into the brake chambers of the service brakes.

Each trailer air line ends with a glad hand (coupler). When two or more vehicles are hitched together, each vehicle has two air line glad hands. It is important to connect corresponding glad hands (of the same colour) to each other. For example, when hitching a tractor to a semi-trailer, you must hook up the air line glad hand for the tractor service brake circuit with the glad hand for the semi-trailer service brake circuit. The same rule applies when connecting the air line glad hands for the trailer or semi-trailer parking (or emergency) brake circuits.

To connect air line glad hands, you must fit them together at a 90° angle and then rotate them until the hoses are lined up straight.

If your road tractor is not hitched to a semi-trailer or trailer, you must hook up each air line glad hand to a dummy glad hand.

If your vehicle has air lines but no dummy glad hands, you can attach the air line glad hands side by side and secure them properly to the vehicle to prevent the air lines from falling to the ground and to keep dirt from entering the system.

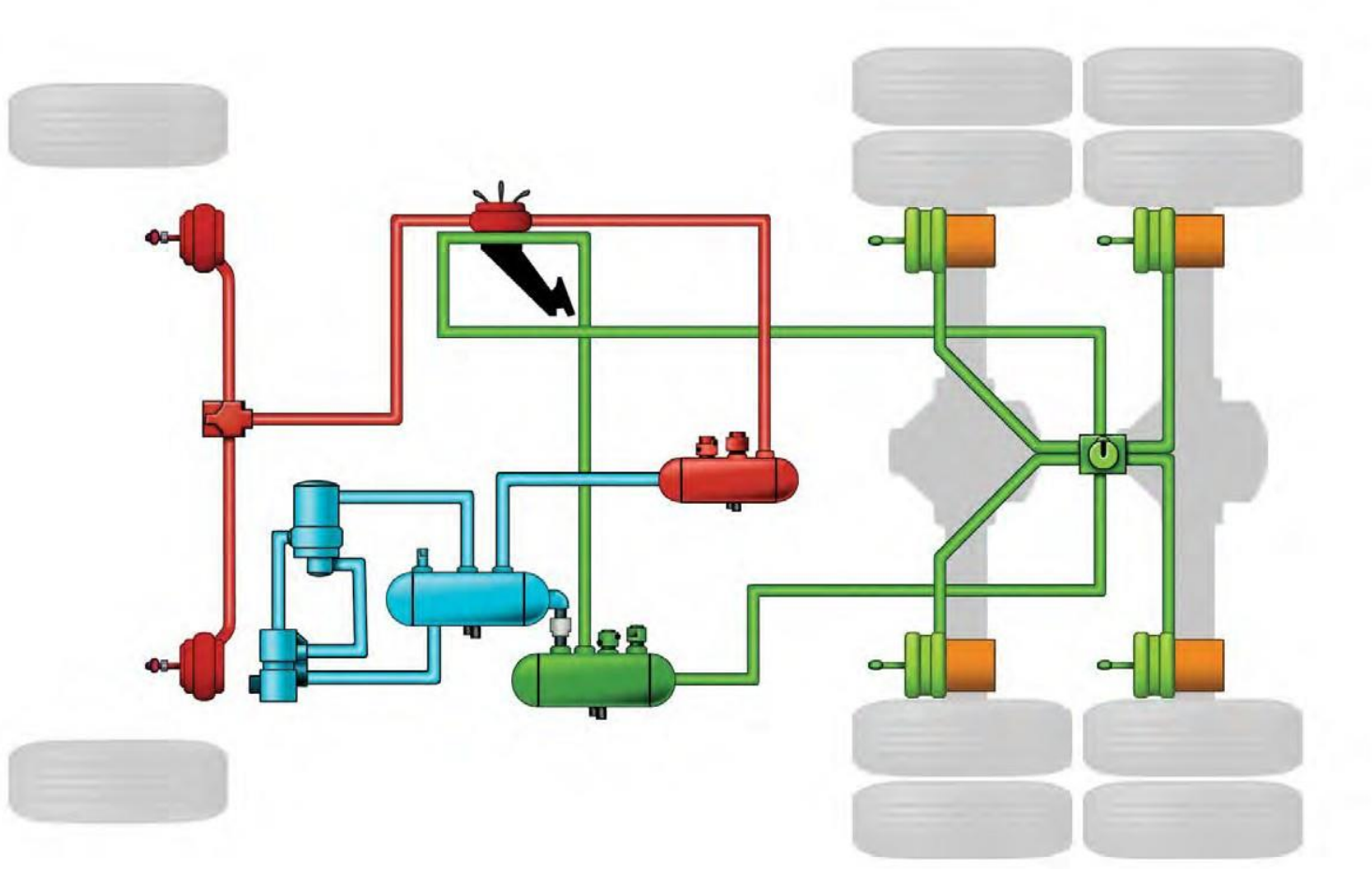
How Service Brakes Work

Service brakes allow you to slow down or stop your vehicle when you are driving under normal conditions. Braking is made possible by complex networks of lines through which air circulates.

Compressed air

The service brake system enables you to stop your vehicle by using various mechanisms to amplify the force you apply on the brake pedal. Even a slight pressure on the brake pedal can result in a great deal of pressure on each vehicle wheel to stop it from turning.

Air circulates through the system. The compressor draws in air from outside the vehicle and sends it through an air purifier and then into the supply reservoir. From there, the air flows to the service reservoirs. Then, when you push down on the brake pedal, the air flows to the brake chambers for each wheel, where sufficient pressure is exerted to drive the brake shoes against the inside wall of the drums or the walls of the discs.

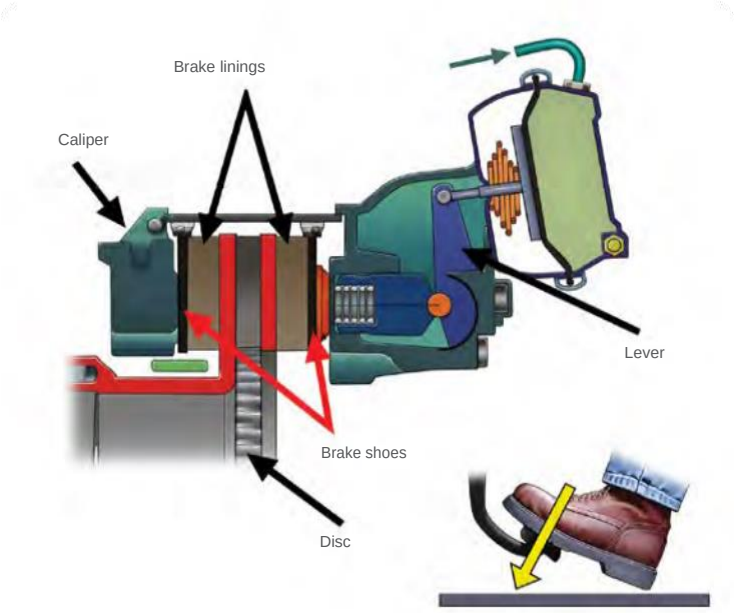


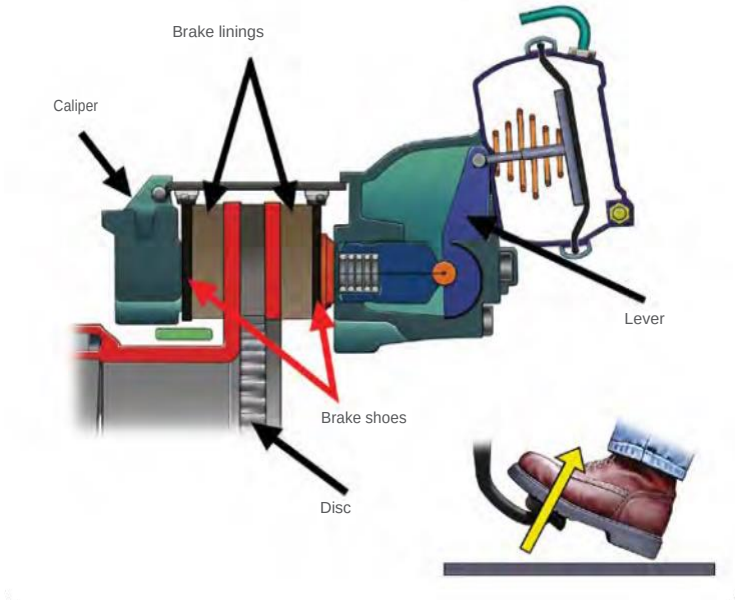
Pressure amplification

The force of compressed air is used in conjunction with the principle of the lever to create a system that generates a considerable amount of braking power.

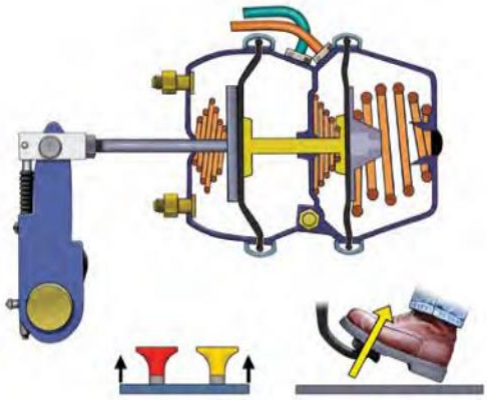
When you push down on the brake pedal, the service reservoirs release air. This compressed air pushes against the diaphragm of the service brake chamber.

Disc brakes with a single brake chamber

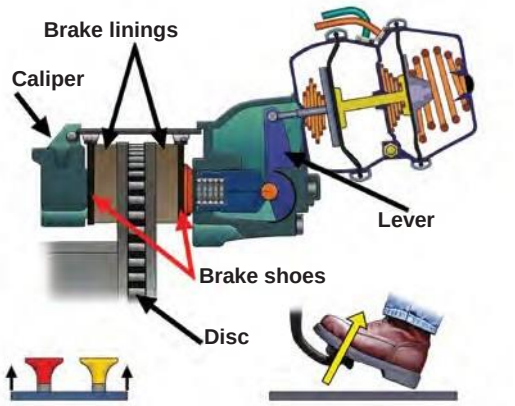




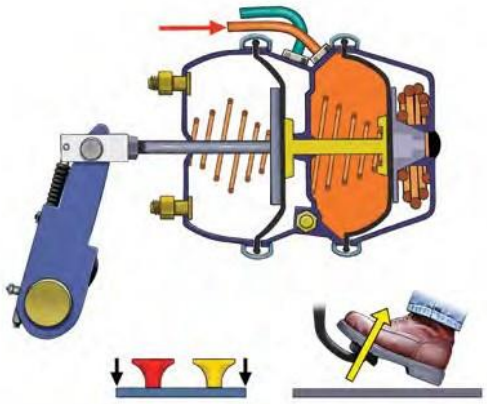
Applied parking brake



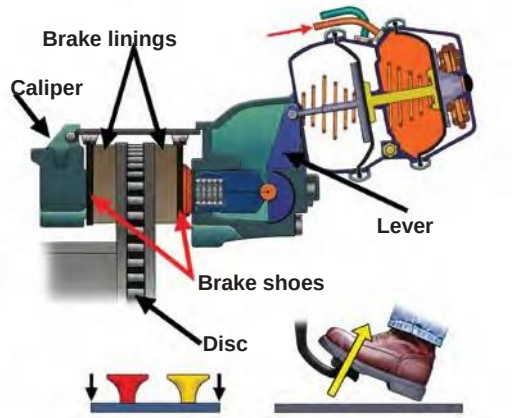
Applied parking brake



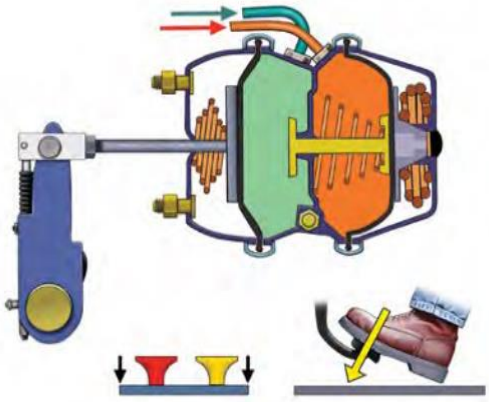
Parking brake air supply



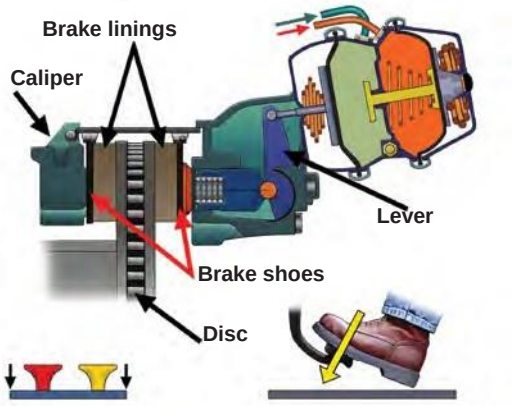
Parking brake air supply



Applying the service brake



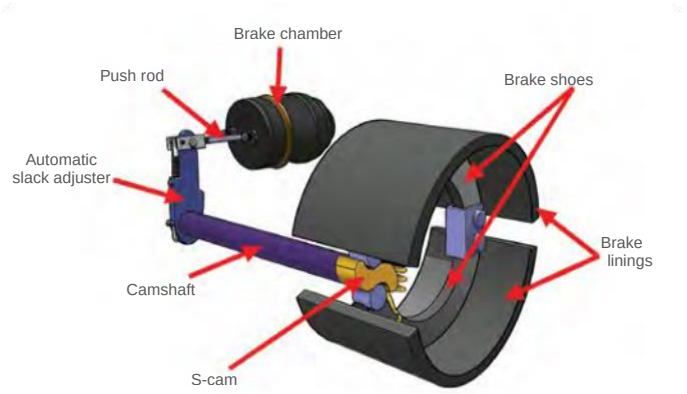
Applying the service brake

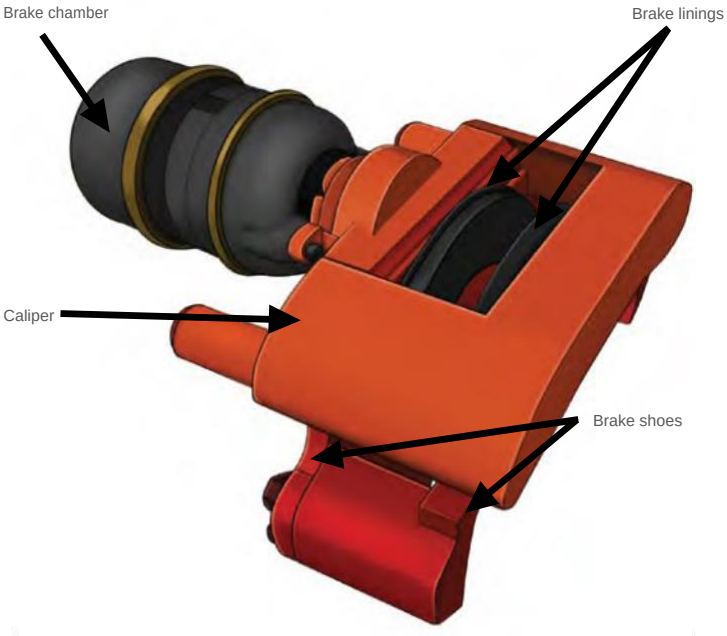


Drum brake

The movement of the diaphragm pushes the push rod, which operates the slack adjuster.

As it moves, the slack adjuster rotates an S-cam via a camshaft. The rotating S-cam pulls the brake shoes apart. This pushes the brake shoe linings against the drum and stops the wheel from turning freely.





Disc brake

The movement of the diaphragm pushes a lever that exerts force (via a piston) on the brake shoe. The force so exerted pushes the brake shoe lining against the disc. An equivalent counterforce is simultaneously transmitted to the caliper, which pushes the opposing brake shoe lining against the disc. The pressure of the linings against the disc stops the wheel from turning freely.

The amount of braking power produced therefore results from the combined effect of several mechanical factors, such as:

- the pressure exerted by the compressed air;
- the size of the brake chamber ;
- the length of the slack adjuster;
- the rotation of the cam (for drum brakes).

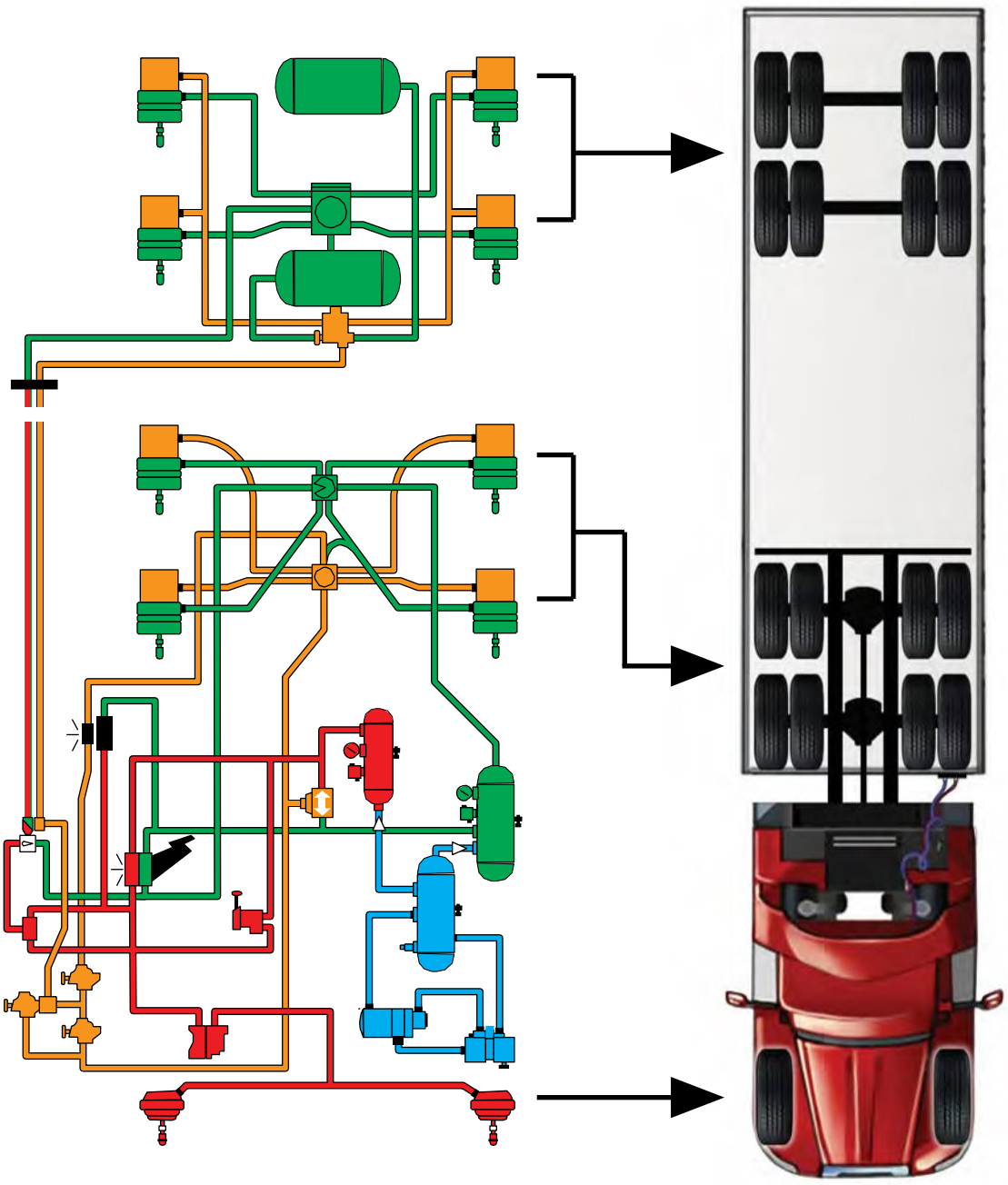
You should also be aware that there is a limit to the braking capacity you can achieve when you push down on the brake pedal. This limit is determined by the maximum amount of air pressure that the service reservoirs can supply and, in the case of drum brakes, the proper adjustment of the slack adjuster.

Reaction time

Air brake systems are very efficient, but react more slowly than hydraulic brakes. To ensure that air brakes will react as quickly as possible, air brake lines have valves. By pushing down on the brake pedal, you send a signal to the first valve. Then the second valve (the relay valve) opens, allowing air to flow into the brake chambers. This way, there is always air on standby, so to speak, and it does not have to travel all the way through the lines before it can exert pressure on the brakes. This reduces the time it takes for air brakes to react.

Nevertheless, air brake systems are somewhat slower than hydraulic brake systems because air can be compressed but brake fluid cannot. It takes one-half second for air to pass through the system. During this time, a vehicle travelling at 90 km/h covers 12.5 m. When driving, you should therefore be aware of the air brake reaction time and the resulting increase in stopping distance.

The semi-trailer's service brakes operate at the same time as those of the tractor. This means that when you push down on the brake pedal, you activate the brakes on all of the vehicle's wheels.



Example of a basic dual-line air brake system for a tractor semi-trailer.

The different colours show how the air is routed through the lines.

Supply line

Rear axle service brake line

Front axle service brake line

Parking brake line

Exercise 5.2

Indicate where the following semi-trailer truck components are located.

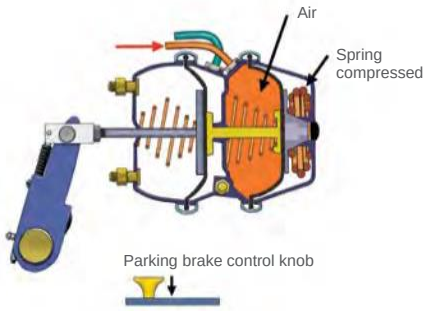
Number	Component	Location
Example	*Service reservoir*	*Behind the right front wheel*
1	Air compressor	
2	Pressure regulator	
3	Supply reservoir	
4	Air purifier	
5	Air bleed valve	
6	Single brake chamber	
7	Double brake chamber	
8	Slack adjuster	
9	Air pressure gauge	
10	Low air pressure indicator	

How the Parking Brake Works

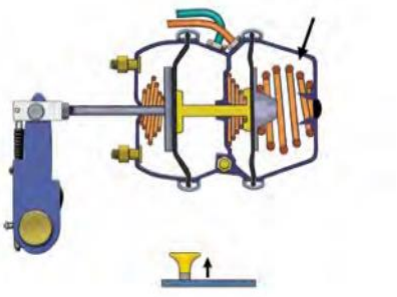
The purpose of the parking brake system is to keep the vehicle stationary when parked. It immobilizes all the wheels of the vehicle equipped with a parking brake.
To activate the parking brake, pull on the parking brake control knob once the vehicle is completely stopped. The air then empties from the parking brake so that the spring in the brake chamber relaxes and exerts pressure on the push rod.

- In the case of a drum brake, the slack adjuster then rotates and squeezes the brakes.
- In the case of a disc brake, the lever pushes the brake linings against the disc and squeezes the brakes.

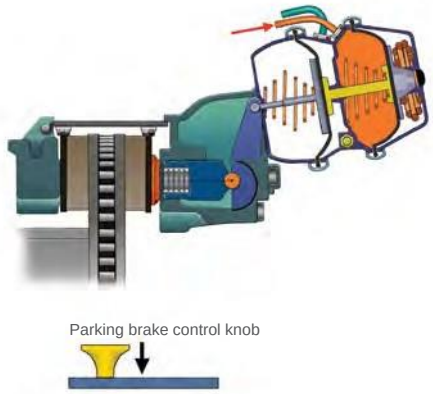
Spring squeezed by air: drum brake released



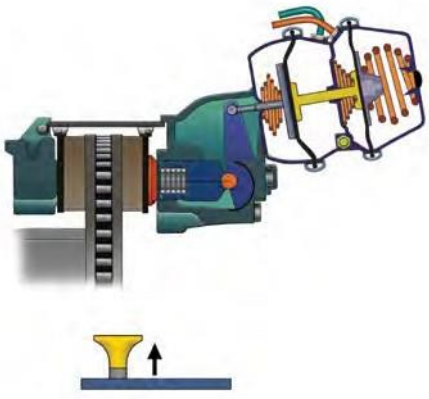
Spring released because of lack of air: drum brake applied



Spring squeezed by air: disc brake released



Spring released because of lack of air: disc brake applied



Conversely, when you release the parking brake by pushing the control knob back in, the air flows back into the brake chamber, compresses the spring, releases the brakes and allows the wheels to turn freely.
When you pull on the parking brake control knob, the wheels of the tractor and the wheels of the trailer or semi-trailer all lock. In addition, the trailer air supply control knob pops out automatically.

However, if you just pull on the trailer air supply control knob, this locks only the trailer or semi-trailer wheels.

How the Emergency Brake Works

The parking brake system also serves as an emergency brake system. If the service brake system fails and prevents compressed air from flowing to the brake chambers, the emergency brake takes over and brings the vehicle to a stop. You can activate the emergency brake yourself. All you have to do is pull on the parking brake control knob. The emergency brake is also activated automatically in an emergency situation, that is, when the air pressure in the service brake system drops below 242 kPa (35 psi).

Many things can cause a drop in air pressure, such as a broken hose or line, or a valve failure. When the emergency brakes are activated, the wheels equipped with brake chambers (parking brakes) begin to lock as soon as the air pressure falls to 483 kPa (70 psi) or below. By the time the pressure drops below 242 kPa (35 psi), all the air has been evacuated from the brake chambers. At that moment, the emergency brake becomes fully engaged and the vehicle comes to a stop.

You are warned ahead of time, however, when an emergency is imminent. The low air pressure indicators are activated when the pressure in the service reservoirs drops below 380 kPa (55 psi). Some vehicle manufacturers go beyond this standard and calibrate the low air pressure warning threshold at 550 kPa (80 psi) to give the driver more time to react.

If your air pressure level drops to this critical level, you must react immediately. As soon as the low-pressure light or buzzer comes on, choose the best spot to stop your vehicle before the air pressure drops so low that the emergency brakes are activated and lock the wheels completely.

If the mechanical problem is serious enough, the drop in air pressure can happen in the space of just a few seconds. Depending on the type of brake system, the rear wheels may lock abruptly and make it very difficult for you to control the vehicle.

Exercise 5.3

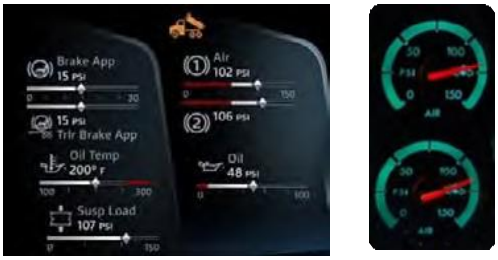
As accurately as possible, draw a sectional view of a double brake chamber with a push rod and an automatic slack adjuster and identify each component.

Gauges and Indicators

Air pressure gauges

The air pressure gauges indicate the air pressure in the service reservoirs of the bus, truck or tractor. Because the service brake system has two independent circuits, there are two gauges on the dashboard, one for the primary circuit and the other for the secondary circuit. Some vehicles are equipped with a single gauge with two needles, one for each circuit, but there is no gauge for the supply reservoir.

If you can, get in a truck cab to take a look at the pressure gauges for the compressed air reservoirs, as well as the service brake pressure gauge. If the truck has two primary reservoirs, does it have a gauge for each one?



Inspecting an air brake system

Mechanical defects related mainly to brakes, tires, wheels, and coupling devices are a determining factor in more than 10% of heavy vehicle accidents. And yet most of those defects could be detected during a proper inspection of the vehicle before it is used.

Either you (as the driver) or a person designated by the operator must perform a vehicle inspection to detect any defects in the air brake system.

The mechanical components of the air brake system that need to be inspected are listed in Section 19 of the Circle Check Guide. The digital version of the Circle Check Guide is available at saaq.gouv.qc.ca.

You will be making these inspections in an exercise in Chapter 6 where you will be carrying out a circle check.

Low air pressure indicator

If the air pressure drops so low in one of the circuits that the service brakes are unable to work effectively, a visual warning device is activated to alert you, usually accompanied by a buzzer. There are two types of visual warning devices: a warning light and a wigwag.

The level at which the low air pressure indicator is activated varies depending on the vehicle's brake system, but is never lower than 380 kPa (55 psi). When the air pressure drops to 380 kPa (55 psi), it is too low to deactivate the parking brake (if it is on), but there is still enough pressure for the vehicle to keep moving if it is already in motion.

Service brake pressure gauge

This gauge measures the compressed air pressure in the brake chambers when the brakes are applied.

Unlike the air pressure gauge, the service brake pressure gauge is not a standard feature in heavy vehicles.

Exercise 5.4

Identify all the dashboard components related to the air brake system in the semi-trailer truck that you have at your disposal.

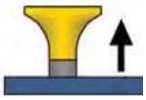
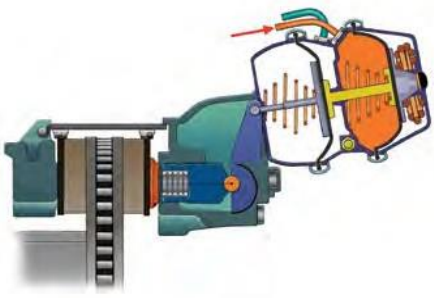
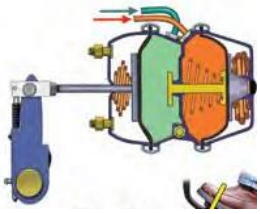
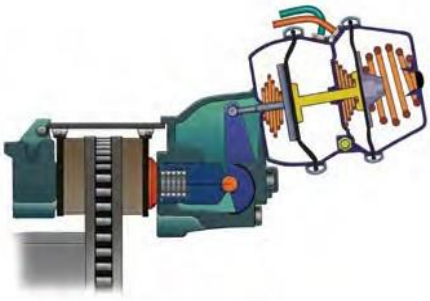
In the chart below, write the name of the component (e.g. tachometer, air pressure gauges for the primary and secondary reservoirs, service brake pressure gauge, etc.), its role, unit of measurement and reading range.

Component	Role	Unit of measurement	Reading range
E.g. Pressure gauges	*Measures the air pressure in the primary reservoir*	*psi*	*0 to 250*

Exercise 5.5

For each brake chamber illustrated, identify:

- the position of the parking brake control knob ;
- the movement of the service brake pedal.

Brake chamber	Position of the parking brake control knob		Movement of the service brake pedal	
				
	○	○	○	○
	○	○	○	○
	○	○	○	○

Exercise 5.6

Indicate whether each of the following statements is true or false.

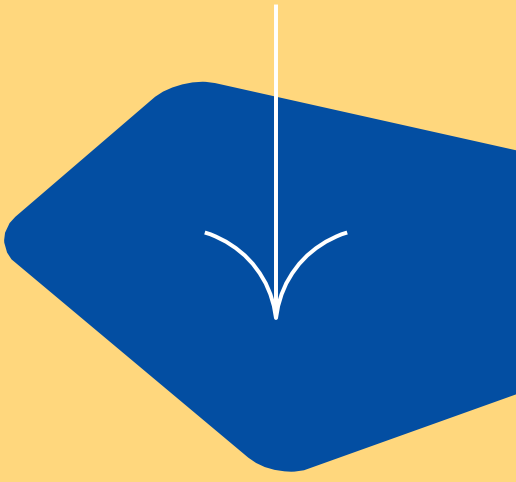
Statements	True	False
1. It is recommended that you use the hand brake control on the road as a service brake.	◯	◯
2. Air brakes react just as quickly as hydraulic brakes when the driver pushes down on the brake pedal.	◯	◯
3. The parking brakes are applied to the wheels by means of compressed air pressure.	◯	◯
4. The service brake for the steering axle is always supplied by the primary circuit.	◯	◯
5. The braking power required to slow a vehicle or bring it to a stop depends on the vehicle's weight and speed.	◯	◯

The answer key is provided at the end of this guide.

Chapter 6

6

Circle Check



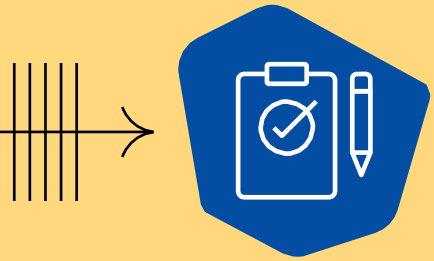
Mechanical defects related mainly to brakes, tires, wheels, and coupling devices are a determining factor in more than 10% of heavy vehicle accidents. They also cause a significant loss of productivity in the carrier industry. Yet, most of those defects could be detected during a proper inspection of the vehicle before it is used.

Either the driver or a person designated by the operator must perform the vehicle inspection in order to ensure that the vehicle complies with the standards in effect. The *Highway Safety Code* specifies that all heavy vehicles must have been checked within the previous 24 hours, otherwise a new “circle check” must be carried out.

The purpose of the circle check is to ensure that:

- the principal components of the vehicle are in good condition;
- the vehicle’s owner and operator are informed of the repairs to be made;
- no vehicles with major defects are operated on our roads.

The ultimate objective is to improve safety for all road users.
For this chapter, please consult the following guide: Circle Check Guide (gouv.qc.ca).



Exercise 6.1

Indicate whether each of the following statements is true or false.

Statements	True	False
1. A vehicle with a minor defect can be operated even if repairs are not performed within 48 hours.	◯	◯
2. The operator must perform the circle check in compliance with regulatory requirements.	◯	◯
3. Drivers must plan their activities in order to be able to perform a new circle check before 24 hours have elapsed.	◯	◯
4. Tool vehicles, such as graders, wheel loaders and back hoes, are exempt from the circle check.	◯	◯
5. The circle check report allows the driver or the person designated by the operator to inform the operator and owner of the vehicle of the results of the inspection and, if applicable, the defects detected.	◯	◯

The answer key is provided at the end of this guide.

Exercise 6.2

Indicate whether each of the following statements is true or false.

Statements	True	False
1. The circle check must absolutely be performed by the vehicle's driver.	◯	◯
2. While checking a motor coach's brake system, you note an air pressure drop of 35kPa (5 psi) in one minute. This air leak constitutes a minor defect.	◯	◯
3. If the wear of two adjacent tire treads on the front tire of a tractor is level with the wear indicator, you cannot operate the vehicle.	◯	◯
4. A driver who detects a minor mechanical defect during a trip is not required to enter it in the circle check report.	◯	◯
5. The driver who performs the circle check does not need to check the power steering fluid level, since this is the mechanic's job.	◯	◯

The answer key is provided at the end of this guide.

Exercise 6.3

Perform the circle check on a semi-trailer truck using the suggested method and fill out the report. Your inspections will be limited to the components that do not require you to move the vehicle. This means that you will not be able to check certain aspects of the brake system.

Exercise 6.4

Choose the correct answer.

1. **The circle check is a complete inspection of all vehicle components.**

   A) True

   B) False

2. **It is prohibited to operate or to allow operation of a vehicle with a major defect indicated on the list of defects.**

   A) True

   B) False

3. **After filling out the circle check report, a minor defect must be repaired within 48 hours.**

   A) True

   B) False

4. **Drivers must note all defects detected during the trip in their circle check report, even if they are only operating within 160 km of their home terminal.**

   A) True

   B) False

5. **During your circle check, you notice that the left mirror is not securely mounted, but is not in danger of falling off. Is this defect minor or major?**

   A) Minor

   B) Major

6. Where do heavy vehicle drivers need to keep their circle check report?

- **A)** They do not have to keep their circle check report in the truck.
- **B)** In the truck for the current day.
- **C)** In the repair shop.
- **D)** In the dispatcher's office.

7. A rear shock absorber shows signs of an oil leak. Is this a defect ?

- **A)** Yes, this is a minor defect.
- **B)** No, this is not a defect.
- **C)** Yes, this is a major defect.

8. When performing a circle check, you detect an air leak in the air suspension line that cannot be compensated by the compressor when the engine is idling. Is this defect minor or major?

- **A)** Minor
- **B)** Major

9. When performing a circle check, you notice a crack in one of the rims. Is this defect minor or major?

- **A)** Minor
- **B)** Major

Source : *ID Semi Truck Parts & Accessories*

10. A mandatory mirror that is missing, broken, cracked or tarnished is considered a minor defect.

- **A)** True
- **B)** False

11. If a single tire or one of the dual tires in the same wheel assembly is deflated or has an audible air leak, it is a minor defect.

- **A)** True
- **B)** False

12. Your high beams are not working. Is this a defect?

- **A)** Yes, but only in the daytime.
- **B)** Yes. It is a major defect.
- **C)** Yes. It is a minor defect.
- **D)** It is not part of the circle check.

13. Which of the following is a major defect?

- **A)** None of the low beams work.
- **B)** None of the high beams work.
- **C)** None of the front parking lights work.
- **D)** None of the front turn signal lights work.

14. Which one of the following components do you need to verify during the circle check ?

- **A)** Motor oil level
- **B)** Engine coolant level
- **C)** Power steering fluid level
- **D)** Transmission oil level

15. Which one of the following defects detected during a circle check of a school bus is major?

- **A)** The first aid kit is not securely mounted.
- **B)** The bus is not equipped with at least three flares, three triangle reflectors or three lamps.
- **C)** The emergency door is out of order.
- **D)** The chemical extinguisher is inadequate.

16. Which one of the following statements is true?

- **A)** A misshapen fifth wheel stopper is a major defect.
- **B)** A windshield blower that does not work is a major defect.
- **C)** When the depth of two adjacent grooves on a tire on the steering axle is equal to the tread wear indicator, it is a major defect.
- **D)** A worn tire valve is a major defect.

17. When should the low-pressure warning(s) for the service brakes activate?

- **A)** When the air pressure drops below 275 kPa (40 psi).
- **B)** When the air pressure drops below 380 kPa (55 psi).
- **C)** When the air pressure drops below 550 kPa (80 psi).
- **D)** When the air pressure drops below 800 kPa (117 psi).

18. Identify the minor defect:

- **A)** There is some movement between a fifth wheel fastener and the vehicle chassis frame.
- **B)** Twenty-five percent of the locking pins of a sliding fifth wheel are inoperative.
- **C)** Twenty percent of the parts fastening the fifth wheel to the tractor frame are missing.

19. Which one of the following is a minor defect?

- **A)** The blower only works on high.
- **B)** The windshield blower does not work.
- **C)** The temperature of the air flow is cold.

20. Indicate the minor defect.

- **A)** The back of the driver's seat does not stay in the set position.
- **B)** The seat is too soft.
- **C)** The seat cushion has a tear measuring 50 cm long.

Exercise 6.5

Choose the correct answer.

1. **Which one of the following statements is true?**

   - ◯ **A)** I have to check the power steering fluid level.
   - ◯ **B)** I do not have to check the power steering fluid level.
   - ◯ **C)** I only have to check the power steering fluid level if the vehicle has a belt-driven pump.
   - ◯ **D)** I only have to check the power steering fluid level if the vehicle has a gear-driven pump.

2. **Which of the following objects are part of the emergency material that must be kept onboard a heavy vehicle?**

   - ◯ **A)** First-aid kit
   - ◯ **B)** Chemical extinguisher
   - ◯ **C)** Reflectors or flares
   - ◯ **D)** Spare tire

3. **You are driving in the daytime and notice that the rear parking lights on your trailer are not working. Which of the following statement is true?**

   - ◯ **A)** This is a major defect.
   - ◯ **B)** This is a minor defect.
   - ◯ **C)** This is a minor defect in the daytime and a major defect at night.
   - ◯ **D)** I can drive the vehicle as long as the defect is recorded in the circle check report.

4. **Which statement describes a minor defect?**

   - ◯ **A)** A wheel is missing a nut.
   - ◯ **B)** A wheel is cracked.
   - ◯ **C)** The fluid level in the power steering pump reservoir is lower than the recommended level.
   - ◯ **D)** The rear parking lights do not work.

5. Which of the following statements describes a major defect?

- **A)** The wiper on the driver's side is inadequate.
- **B)** One of the low beams does not work.
- **C)** The compressor starts when the pressure is less than or equal to 550 kPa (80 psi).
- **D)** The horn does not work.

6. Which piece of information does not need to be recorded in the circle check report?

- **A)** The odometer reading at the time of the circle check.
- **B)** The operator's name.
- **C)** The number on the shipping documents.
- **D)** The date of the circle check.

7. What do you have to do when you find a major defect on a vehicle?

- **A)** I have to record it in the circle check report and have it repaired within 48 hours.
- **B)** I have to stop driving the vehicle immediately.
- **C)** I need to have it repaired at the end of the day.
- **D)** If I operate within a 160-kilometre radius, I need to have it repaired within 48 hours.

8. Which of the following statements is false?

- **A)** The circle check report only needs to be on board the vehicle when I drive beyond a 160-kilometre radius.
- **B)** A circle check report must be filled out for each circle check.
- **C)** The circle check report must always be on board the vehicle.

9. Which component does not require inspection during a circle check?

- **A)** Tiedowns
- **B)** Mirrors
- **C)** Coupling device
- **D)** Seat belt

10. Which of the following vehicles are subject to circle check regulations?

- **A)** Vehicles used in the event of a disaster.
- **B)** Vehicles used by unpaid movers.
- **C)** Commercial vehicles with a GVWR of 4,500 kg or more.
- **D)** Commercial vehicles with a net mass of 2,500 kg or more.

11. When is a heavy vehicle circle check mandatory?

- **A)** Before 24 hours have elapsed.
- **B)** At the beginning of my work shift, only when I drive beyond a 160-kilometre radius.
- **C)** Only when I find a minor defect on the vehicle.
- **D)** Only when I find a major defect on the vehicle.

12. What should you do if you detect an air leak in one of the tires of your semi-trailer during a trip?

- **A)** I can go to my home terminal after checking the temperature of the other tires.
- **B)** I can keep driving and stop at the nearest garage.
- **C)** I cannot drive this vehicle until the tire is repaired.
- **D)** I can drive after inflating the tire to the right pressure.

13. Which of these inspections is mandatory during a circle check?

- **A)** Airtightness of the service brake.
- **B)** Solidity of the master cylinder.
- **C)** Minimum pressure at which the parking brake is engaged.
- **D)** The pressure in the air brake system before I start the engine.

14. Can you drive a semi-trailer truck on the road if the hitched road tractor has no rear parking lights?

- **A)** Yes
- **B)** No. Not under any circumstances.
- **C)** Yes, but only at night.
- **D)** Yes, but not on a highway.

15. Can you drive a semi-trailer truck if the turn signal lights (left and right) on the semi-trailer do not work?

A) No. Not under any circumstances.

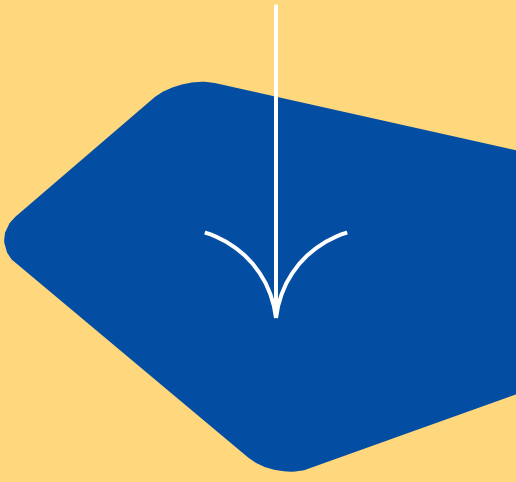
B) Yes, because this is a minor defect.

C) Yes, but only in the daytime.

D) Yes, but only on highways.

The answer key is provided at the end of this guide.

7 Basic Manoeuvres



This chapter contains a series of exercises to help you acquire the knowledge and practice the skills that are essential to performing basic manoeuvres at the wheel of a semi-trailer truck.

These exercises can be done in the order presented or switched around to suit the pedagogical model or your learning path. They can also be grouped together when planning lessons in safe practice areas or on the road network. For instance, a three-hour lesson at the wheel of a heavy vehicle could include several exercises.

Each exercise sheet includes the following: a summary of the exercise, a list of the learning objectives, a description of the learning environment and any tasks to be completed beforehand to help you prepare. Some exercise sheets include an appendix containing useful tips or specific instructions.

The knowledge, abilities and soft skills you have already acquired will be put to use during these exercises. The soft skills described in the exercise sheets correspond to the attitudes and behaviours that are expected of you.

The exercise sheets are followed by a table where you can log your hours and track your progress toward meeting the requirements of the Class 1 RSEP training course. The table is followed by several self-evaluations. Your instructor will let you know when you must complete them.

Pre-Driving Adjustments and Starting the Vehicle

Exercise 7.1

- **Competency component:** 7.1
- **Time required:** 30 minutes
- **Frequency:** Before each departure

Overview

Summary

Your instructor will show you how to adjust your seat, seat belt, steering wheel, headrest, mirrors and so on. You will then make the required adjustments yourself and start the engine while following the proper procedures and safety measures.

Learning Objectives

Knowledge and abilities:

- Use the three-point contact method to get in and out of the cab.
- Make any necessary pre-driving adjustments to your seat, steering wheel, headrest, etc.
- Properly adjust your mirrors.
- Start the engine.
- Be able to read the indicator gauges, interpret the warning devices and use the various controls (levers, switches, buttons, and so on).

Soft skills:

- Understand that you must check the dashboard indicators and make any necessary adjustments to your seat, mirrors and other equipment before driving off so that you can stay focused on the road.

Exercise

Learning Environment

Where:

- Safe practice area

What you will need:

- Road tractor and semi-trailer

Preparation

Tasks to complete beforehand:

- Read about how to make pre-driving adjustments. (Chapter 4).
- Read about how to start the truck's engine (Chapter 4).

Appendix – Starting the engine

Never make adjustments while the truck is moving.

1) If the vehicle has a battery disconnect switch (which prevents battery drain when the vehicle is not in use), re-establish the battery connection.
2) Insert the key in the ignition.
3) If the truck has an automatic transmission, shift into neutral (N).
4) If the truck has a manual transmission, press the clutch pedal. This reduces wear on the starter and minimizes load on the engine, especially in cold weather.
5) Turn the ignition key to the ON position and scan the dashboard indicators.
6) Turn the ignition key all the way to the right until the engine turns over.
7) Check the oil pressure gauge to make sure the engine has the proper oil pressure. Avoid letting the engine run if, after a few seconds, the gauge's needle reading indicates no oil pressure.

Learning How to Do a Circle Check of a Road Tractor

Exercise 7.2

- **Competency component:** 7.1
- **Time required:** 1 hour and 30 minutes
- **Frequency:** Once

Overview

Summary

At the beginning of the exercise, the instructor will identify road tractor components that you must inspect when doing your circle check, without discussing any potential defects or providing further explanations (approximately 30 minutes).

You will then carry out a circle check under the supervision of your instructor, taking care to name each component you inspect and to identify any major or minor defects you find.

Learning Objectives

Knowledge and abilities:

- Know and be able to locate the components that must be inspected during a circle check.
- Become familiar with and at ease carrying out the circle check of a road tractor.
- Be able to distinguish between minor and major defects.

Soft skills:

- Listen actively to the instructor's explanations, while taking care not to disturb the instructor or your fellow students.
- Place yourself so that you can properly see each component and adopt a listening posture that promotes learning.

Exercise

Learning Environment

Where:

- Safe practice area

What you will need:

- Road tractor

Preparation

Tasks to complete beforehand:

- Review the systems and components of a heavy vehicle (Chapter 2).
- Review the appropriate circle check inspection method (Chapter 6).

Doing a Circle Check of a Road Tractor

Exercise 7.3

- **Competency component:** 7.1
- **Time required:** 30 minutes
- **Frequency:** Once

Overview

Summary

You will do the circle check of a road tractor. As applicable, the other students will follow along and bring a list of the components to be inspected. Your instructor will provide feedback once you finish.

Learning Objectives

Knowledge and abilities:

- Be able to do the circle check of a road tractor on your own without requiring assistance.
- Be able to name and describe out loud each component you inspect.
- Be able to determine the condition of the inspected components.

Soft skills:

- Understand what is required in order to stay safe (e.g. protective gear and the three-point contact method).
- Do the circle check carefully and understand that it is not just a legal requirement, but also crucial to road safety.

Exercise

Learning Environment

Where:

- Safe practice area

What you will need:

- Road tractor
- Any material recommended by the instructor
- Appropriate list of defects: List 1 – Heavy Vehicles (refer to the Circle Check Guide)
- List of components to inspect

Preparation

Tasks to complete beforehand:

- Go back over your introduction to the circle check (Exercise 7.2).
- Review the appropriate circle check inspection method (Chapter 6).

Appendix

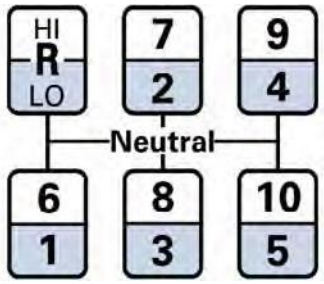
The circle check sheet for road tractors can be found in Appendix 2.

Gear Shift Pattern and Friction Point Basics

Exercise 7.4

If the vehicle is equipped with an automatic transmission or automated manual transmission, go to Exercise 7.4A.

- **Competency component:** 7.2
- **Time required:** 30 minutes
- **Frequency:** Whenever you change vehicles



Overview

Summary

With the vehicle stopped, you will move through the entire gear shift pattern without setting the vehicle in motion. You will then go through the pattern again, but this time you will use the friction point to set the vehicle in motion without stalling the engine. Shifting gears requires memory and dexterity. To be able to shift gears while keeping your eyes on the road, you must memorize the shift pattern.

Learning Objectives

Knowledge and abilities:

- Find the friction point to set the vehicle in motion.
- Memorize and run through the gear shift pattern.
- Understand and recognize different types of clutches (with or without free play)

Soft skills:

- Understand that it is important to master shifting gears as this skill will help you drive safely and responsibly.

Exercise

Learning Environment

Where:

- Safe practice area

What you will need:

- Road tractor with a non-synchromesh transmission and a semi-trailer

Preparation

Tasks to complete beforehand:

The point of friction may differ from one truck to the next. Your instructor will show you how to find it.

- Review gear shift pattern notions (Chapter 4).
- Review friction point and clutch notions (Chapter 4).

Appendix

Use a road tractor on its own the first time you do this exercise, and after that always use a road tractor that has been hitched to a semi-trailer.

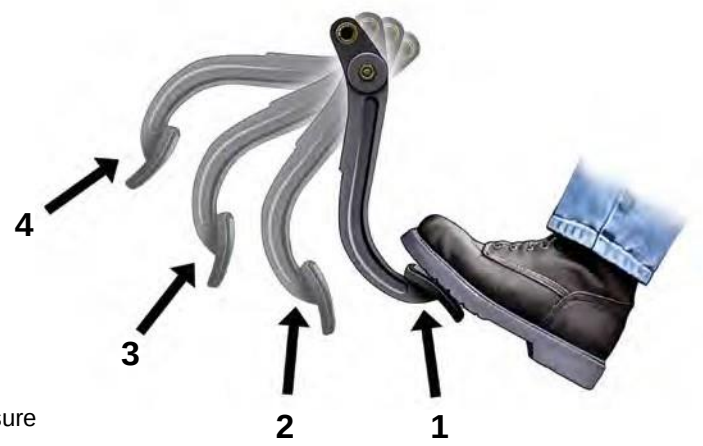
Moving through the gear shift pattern

1) Start the engine with the parking brake engaged.
2) Keep your foot on the clutch pedal and move through the entire gear shift pattern. Measure how far the gear shaft moves in the gear box when shifting between each gear (refer to the red arrows).
3) Simulate changing gears.

Repeat this exercise as needed and whenever you change vehicles.

Finding the friction point

1) Start the engine with your foot on the service brake and then release the parking brake.
2) With the wheels stationary, press all the way down on the clutch to engage the clutch brake (Position 4).
3) Shift into your starting gear.
4) Gently let the clutch out until you reach the friction point (Position 2).
5) Release the service brake.
6) Continue to slowly ease the clutch out from Position 2 to Position 1.
7) Gradually press down on the accelerator.



Slowly bring the vehicle to a stop, taking care to moderate the pressure exerted on the brake pedal, and then repeat Steps 1 through 6 again.

You will find the friction point (Position 2) by qbeing attuned to the truck's vibrations. The clutch pedal travel should allow you to feel this sensation before the engine stalls. It is at this point that you release the service brake pedal and ease up completely on the clutch pedal.

Using an Automatic or Automated Manual Transmission

Exercise 7.4A

- **Competency component:** 7.2
- **Time required:** 1 hour
- **Frequency:** Whenever you change vehicles

Overview

Summary

You will use the automatic or automated manual transmission controls to set the vehicle in motion. You will also practice using the relevant buttons or levers to switch gears manually instead of automatically, where this is an option.

Learning Objectives

Knowledge and abilities:

- Be able to identify different types of transmissions.
- Use the automatic or automated manual transmission controls.
- Understand the usefulness of being able to change gears manually.

Soft skills:

- Understand that being able to manually change gears when driving a vehicle with an automatic or automated manual transmission will help you drive safely and responsibly, especially in mountainous terrain.

Exercise

Learning Environment

Where:

- Safe practice area

What you will need:

- Road tractor with an automatic or automated manual transmission and a semi-trailer

Preparation

Tasks to complete beforehand:

Controls may vary from one vehicle to the next. Your instructor will demonstrate the specific characteristics of the vehicle you will be using.

- Review the differences between manual, automatic and automated manual transmissions (Chapter 2).
- Review the characteristics of each type of transmission (Chapter 4).

Appendix

Press firmly on the brake pedal when switching gears manually.

If the vehicle is equipped with air brakes, make sure you have enough air pressure in the reservoirs before doing so.

Given that the vehicle you are using is equipped with an automatic or automated manual transmission, skip to Exercise 7.7.

Upshifting Through the Lower Gears

Exercise 7.5

- **Competency component:** 7.2
- **Time required:** 30 minutes
- **Frequency:** Each time you use the vehicle

Overview

Summary

You will upshift through the lower gears in a moving vehicle equipped with a non-synchromesh manual transmission.

Learning Objectives

Knowledge and abilities:

- Upshift through the lower gears.
- Develop your ability to coordinate working the clutch and shifting the gears.
- Use the double-clutching technique.

Soft skills:

- Learn how to manage stress while upshifting.
- Be aware that poor technique can lead to costly repairs and downtime.

Exercise

Learning Environment

Where:

- Safe practice area

What you will need:

- Road tractor and semi-trailer with a non-synchromesh manual transmission

Preparation

Tasks to complete beforehand:

- Review the notions regarding how much the engine speed needs to increase before shifting to a higher gear (Chapter 4).
- Review the friction point and gear shift pattern notions seen previously (Exercise 7.4).
- View the available videos.

Appendix

Use a road tractor on its own the first time you do this exercise, and after that always use a road tractor that has been hitched to a semi-trailer.

1) Start the engine.
2) Set the vehicle in motion in first gear (see the gear shift pattern in the image at the top of the page).
3) Use the double-clutching technique to upshift into second gear and then into each of the other lower gears.
4) Repeat this exercise until you are comfortable shifting through all the lower gears.
5) Once you have mastered this skill, go on to the exercise on downshifting so that you can combine upshifting and downshifting.

Three things to keep in mind when preparing to shift gears:

- Grab the gear selector.
- Press the clutch pedal down past the upper free play position to the friction point.
- Keep the engine speed stable.

Downshifting

Exercise 7.6

- **Competency component:** 7.2
- **Time required:** 1 hour and 30 minutes
- **Frequency:** Every time you use the vehicle

Overview

Summary

You will upshift through the lower gears in a moving vehicle and then downshift through the same gears.

Learning Objectives

Knowledge and abilities:

- Master the downshifting technique.
- Control the accelerator while shifting gears.
- Use the double-clutching technique.

Soft skills:

- Notice how important it is to use a gentle touch when working the clutch, gear selector and accelerator.

Exercise

Learning Environment

Where:

- Safe practice area

What you will need:

- Road tractor and semi-trailer with a non-synchromesh manual transmission

Preparation

Tasks to complete beforehand:

- Review the notions regarding how much the engine speed needs to increase before shifting to a higher gear, as well as the double clutching technique (Chapter 4).
- Review the gear shift pattern notions seen previously (Exercise 7.4).
- Review the friction point and upshifting notions seen previously (Exercise 7.5).

Appendix

Use a road tractor on its own the first time you do this exercise, and after that always use a road tractor that has been hitched to a semi-trailer.

1) Start the engine.
2) Set the vehicle in motion.
3) Upshift using the double-clutching technique.
4) Downshift.
5) Repeat these steps for the duration of the exercise.

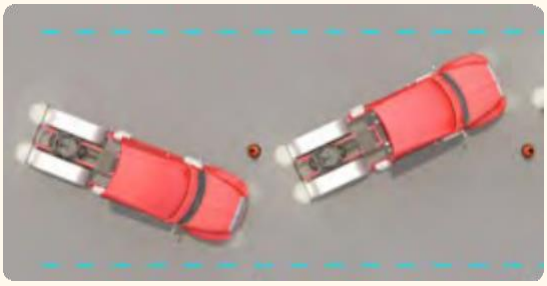
Three things to keep in mind when preparing to shift gears:

- Grab the gear selector.
- Press the clutch pedal down past the upper free play position to the friction point.
- Keep the engine speed stable.

Serpentine Backing Up While Unhitched

Exercise 7.7

- **Competency components:** 7.2 and 8.2
- **Time required:** 30 minutes
- **Frequency:** Once



Overview

Summary

You will back up the unhitched road tractor between a series of cones, which will require you to weave the vehicle in an S-shaped pattern. You will need to use your side mirrors while steering the vehicle and this exercise will help you identify the vehicle's blind spots.

Learning Objectives

Knowledge and abilities:

- Learn to assess a situation before acting.
- Practice using your side mirrors.
- Identify the blind spots around your vehicle.
- Achieve greater control of the steering wheel in order to guide the road tractor in the direction you want it to go.
- Back up the road tractor while keeping the radius of each curve as tight as possible.

Soft skills:

- Pay careful attention to your surroundings to ensure the safety of other road users.

Exercise

Learning Environment

Where:

- Safe practice area

What you will need:

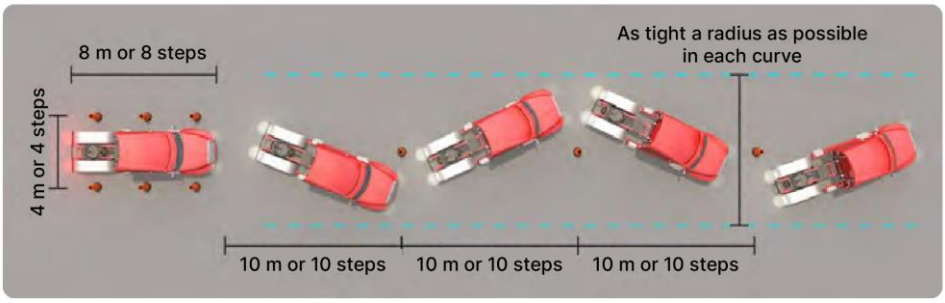
- Road tractor
- Nine cones

Preparation

Tasks to complete beforehand:

- Review backing up notions (Chapter 4).
- View the video provided with the training material.

Appendix



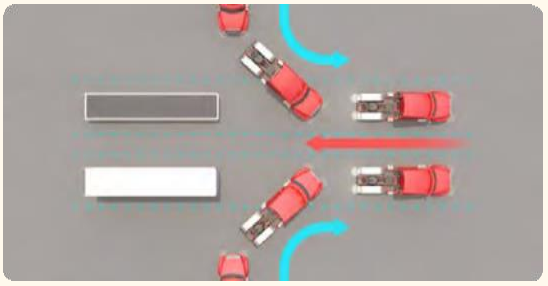
Abilities

- Lower your window.
- Use a lower engine speed.
- Do not accelerate.
- Activate your hazard lights.

Backing Up To Position a Road Tractor for Hitching

Exercise 7.8

- **Competency component:** 7.2
- **Time required:** 30 minutes
- **Frequency:** Every time you hitch a semi-trailer



Overview

Summary

You will practice backing up a road tractor so that it is properly positioned for hitching a semi-trailer. (Note that you can follow the same steps to back a road tractor into a parking bay).

Learning Objectives

Knowledge and abilities:

- Correctly position a road tractor for hitching a semi-trailer.
- Use as little forward space as possible when preparing to back up toward the semi-trailer.
- Back up in a straight line until the road tractor is positioned beneath the semi-trailer.

Soft skills:

- Take your time to perform this manoeuvre correctly and carefully rather than attempting to do it as quickly as possible.

Exercise

Learning Environment

Where:

- Safe practice area

What you will need:

- Road tractor and semi-trailer

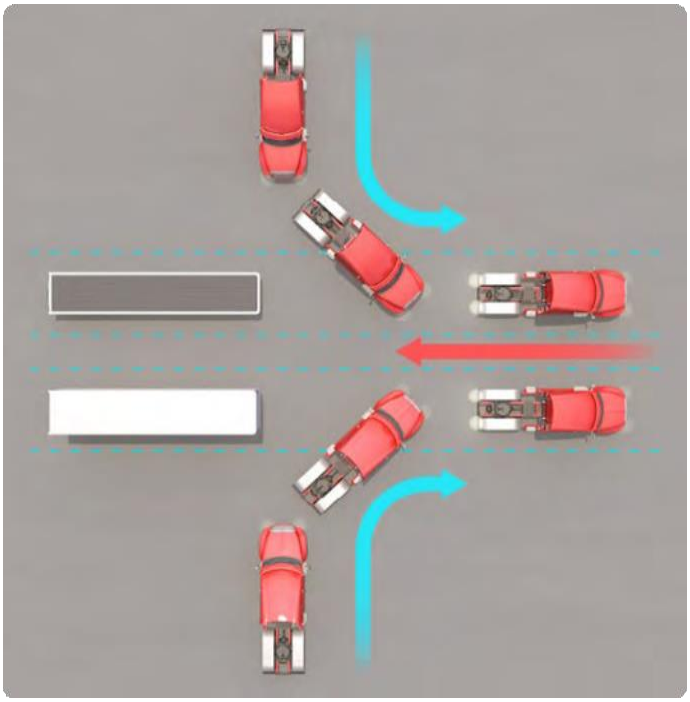
Preparation

Tasks to complete beforehand:

- Review the methods for hitching and unhitching a semi-trailer (Chapter 4).
- Review the steering and side mirror notions seen previously (Exercise 7.7).

Appendix

1) Assess the situation.
2) As you arrive, locate your reference points on the road tractor and on the semi-trailer you will be hitching.
3) Use your side mirrors to keep an eye on the reference points and the semi-trailer as you pull into position before backing up.
4) Line up the vehicle with the semi-trailer.
5) Completely straighten out the road tractor's wheels.
6) Back up, taking care to turn the steering wheel lightly and gently when making any adjustments.
7) Use both side mirrors to continually check both sides of the semi-trailer as you back up.



Note

Road tractors are slightly narrower than semi-trailers.

Abilities

› Lower your window.
› Use a lower engine speed.
› Do not accelerate.
› Activate your hazard lights.

Learning How to Hitch a Semi-Trailer

Exercise 7.9

- **Competency component:** 7.3
- **Time required:** 30 minutes
- **Frequency:** Once

Overview

Summary

Your instructor will help you the first time you hitch a semi-trailer.

Learning Objectives

Knowledge and abilities:

- Learn the steps involved in hitching a semi-trailer.

Soft skills:

- Listen actively to the instructor's explanations, taking care not to disturb any fellow students.
- Be aware of the dangers involved in hitching a semi-trailer.

Exercise

Learning Environment

Where:

- Safe practice area

What you will need:

- Road tractor and semi-trailer

Preparation

Tasks to complete beforehand:

- Review the notions regarding hitching a semi-trailer (Chapter 4).
- View the video provided with the training material.

Learning How to Do a Circle Check of a Semi-Trailer Truck

Exercise 7.10

- **Competency component:** 7.1
- **Time required:** 30 minutes
- **Frequency:** Once

Overview

Summary

Under the supervision of your instructor, you will identify each component on the semi-trailer truck that needs to be inspected during the circle check and name the possible major and minor defects.

Learning Objectives

Knowledge and abilities:

- Learn what needs to be inspected when doing a circle check of a semi-trailer truck so the procedure becomes second nature.
- Identify each component that must be inspected during a circle check.
- Determine the condition of the components inspected.

Soft skills:

- Listen to your instructor's comments and feedback and follow their instructions.

Exercise

Learning Environment

Where:

- Safe practice area

What you will need:

- Road tractor and semi-trailer

Preparation

Tasks to complete beforehand:

- Review the appropriate circle check inspection method (Chapter 6).
- View the video provided with the training material.

Learning How to Unhitch a Semi-Trailer

Exercise 7.11

- **Competency component:** 7.3
- **Time required:** 30 minutes
- **Frequency:** Once

Overview

Summary

Your instructor will help you the first time you unhitch a semi-trailer.

Learning Objectives

Knowledge and abilities:

- Learn the steps involved in hitching a semi-trailer.

Soft skills:

- Pay attention to the instructor's explanations, while respecting your fellow students.
- Be aware of the dangers involved in unhitching a semi-trailer.

Exercise

Learning Environment

Where:

- Safe practice area

What you will need:

- Road tractor and semi-trailer

Preparation

Tasks to complete beforehand:

- Review the notions regarding unhitching a semi-trailer (Chapter 4).
- View the video provided, if available.

Hitching a Semi-Trailer

Exercise 7.12

- **Competency component:** 7.3
- **Time required:** 30 minutes
- **Frequency:** Whenever you must hitch a semi-trailer as part of another exercise

Overview

Summary

You will back into position, hitch the semi-trailer and check that the fifth wheel is securely locked.

Learning Objectives

Knowledge and abilities:

- Line up the road tractor with the semi-trailer.
- Hitch the semi-trailer by following the steps provided in the appendix.
- Check and confirm that the fifth wheel's coupling mechanism is in the lock position.

Soft skills:

- Take care to perform this manoeuvre slowly and accurately.

Exercise

Learning Environment

Where:

- Safe practice area

What you will need:

- Road tractor and semi-trailer
- Protective gear

Preparation

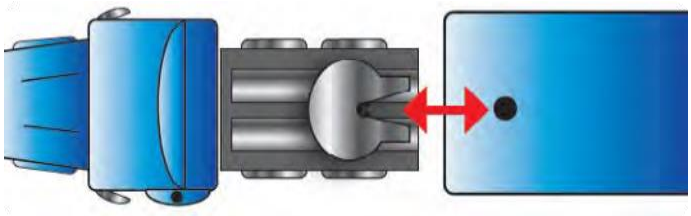
Tasks to complete beforehand:

- Review the notions regarding hitching (Chapter 4).
- Make sure you master **backing up to position a road tractor for hitching** (Exercise 7.8).
- Review how to hitch a semi-trailer (Exercise 7.9).

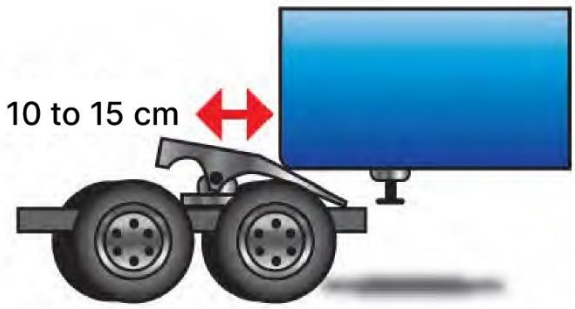
Appendix

Line up the road tractor so that it's properly positioned in front of the semi-trailer.

Important: Road tractors are often narrower than semi-trailers. Be sure to climb down from the tractor cab, check the position of the road tractor and make any necessary adjustments.



Check the height of the semi-trailer and adjust it as needed. The fifth wheel should raise the semi-trailer slightly when hitched, which means that the pivot point should be slightly higher than the semi-trailer's upper coupling plate.



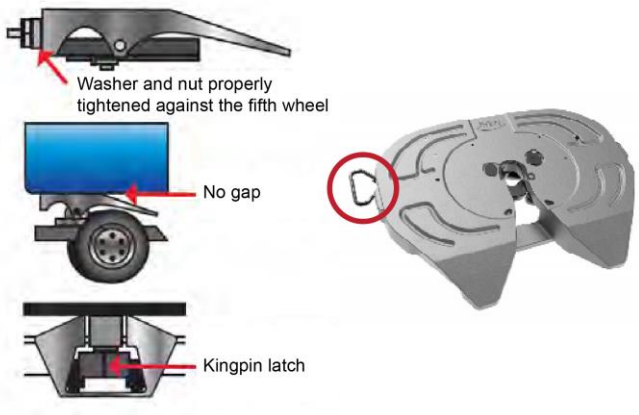
Inspect the condition of the upper coupling plate and kingpin.

Hitch the semi-trailer by backing up until the fifth wheel slides under the semi-trailer and its coupling mechanism (jaws) locks around the kingpin.

Slowly try to move the road tractor forward to check whether the fifth wheel's coupling mechanism is securely locked (tug test).

Get out and visually inspect the release handle, washer and nut (if the semi-trailer is equipped with these components) and inspect the **jaws** around the kingpin. There should **not be any gap between the base of the upper coupling plate and the fifth wheel.**

Do not rely on the tug test alone to make sure the fifth wheel coupling mechanism is securely locked and that the semi-trailer has been properly coupled.



Connect the electrical cord and air lines. Verify the condition of the Glad hand (coupler) seals and replace them as needed.

Check the air supply of the air suspension system by making sure the air springs are properly inflated or by checking the valve or the air pressure gauge, if the semi-trailer is equipped with one.

When inspecting the semi-trailer, check whether the air springs are properly inflated and raise the landing gear.

Raise the landing gear.

Doing a Circle Check of a Semi-Trailer Truck

Exercise 7.13

- **Competency component:** 7.1
- **Time required:** 30 minutes
- **Frequency:** Six times in Chapter 7 and at the beginning of every exercise in Chapter 8

Overview

Summary

- You will perform a circle check of a loaded semi-trailer truck and verify that its cargo is properly secured. You will describe out loud everything you are inspecting and mention any defects or issues you observe. The first few times you do this, you may take the time you need to properly master each step. As you progress, your instructor may ask you to complete the circle check within 20 minutes.
- Depending on how the course is set up, other students may attend the exercise and bring with them the list of components to be inspected (refer to Appendix 2). You and any other students participating in the exercise will be encouraged to discuss with your instructor how the circle check of a semi-trailer truck differs from that of a road tractor alone. Your instructor will provide feedback once you have finished the circle check.

Learning Objectives

Knowledge and abilities:

- Inspect each component covered by the circle check, as well as the tiedown devices.
- Work toward completing the circle check within a reasonable amount of time (approximately 20 minutes).
- Check the cargo securement system.

Soft skills:

- Demonstrate your ability to adequately communicate the results of the circle check and of any other verifications you make.
- Be open to feedback from your instructor.

Exercise

Learning Environment

Where:

- Safe practice area

What you will need:

- Loaded semi-trailer truck with a cargo secured by tiedown devices
- Manual tools
- Protective gear
- List of defects for heavy vehicles (refer to the Circle Check Guide)
- List of components to inspect
- Watch or stopwatch

Preparation

Tasks to complete beforehand:

- Review the appropriate circle check method (Chapter 6).
- Have completed a circle check (Chapter 7, Exercise 7.10).
- Watch the video on the circle check.

Unhitching a Semi-Trailer

Exercise 7.14

- **Competency component:** 7.3
- **Time required:** 30 minutes
- **Frequency:** Every time another activity requires a semi-trailer to be unhitched

Overview

Summary

You will unhitch and perform an end-of-trip inspection of the semi-trailer.

Learning Objectives

Knowledge and abilities:

- Make sure the semi-trailer is in a flat area where it is safe to unhitch.
- Unhitch the semi-trailer.
- Perform an end-of-trip inspection.

Soft skills:

- Show good judgment when choosing a spot to unhitch the semi-trailer.

Exercise

Learning Environment

Where:

- Safe practice area

What you will need:

- Loaded semi-trailer truck
- Hand tools
- Protective gear

Preparation

Tasks to complete beforehand:

- Review the notions regarding unhitching a semi-trailer (Chapter 4).
- Review how to unhitch a semi-trailer (Exercise 7.11).

Appendix

Make sure the road tractor is lined up with the semi-trailer in a safe area and then apply the parking brakes on both the tractor and semi-trailer.

Perform a post-trip inspection (tires, lights, cargo securement, etc.) and dump the air suspension of the semi-trailer, if applicable.

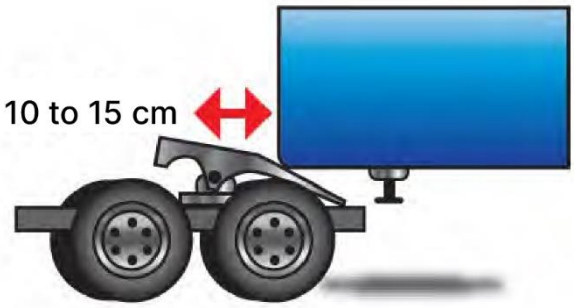
Lower the landing gear until it is firmly braced against the ground. The pressure applied on the ground by the landing gear will vary depending on the type of terrain, the load and the height of the road tractor.

Unhook the electrical cord and air lines.

Pull the release lever on the fifth wheel.

Lower the road tractor's air suspension.

Move the road tractor forward to release the kingpin from the fifth wheel, but leave part of the side rails beneath the semi-trailer.



Check the semi-trailer's position and make sure that the landing gear does not fail or sink into the ground before driving away.

Do not forget to reinflate the tractor's air springs.

Parking
(Post-Trip Inspection)

Exercise 7.15

- **Competency component:** 7.2
- **Time required:** 5 minutes
- **Frequency:** At the end of each work shift

Overview

Summary

After parking the road tractor and semi-trailer, you will perform a post-trip inspection to identify any mechanical issues and make sure the vehicle is ready for its next trip.

Learning Objectives

Knowledge and abilities:

- Adopt safe and responsible practices when parking the semi-trailer.
- Understand the difference between an end-of-trip inspection and the circle check.

Soft skills:

- Take responsibility for the equipment you use and any cargo or goods you are in charge of.

Exercise

Learning Environment

Where:

- Safe practice area

What you will need:

- Loaded semi-trailer truck
- Protective gear

Preparation

Tasks to complete beforehand:

- Review the notions regarding parking a semi-trailer truck (Chapter 4).
- Be familiar with the components to check after parking a semi-trailer truck and the types of issues that should be addressed.

Appendix

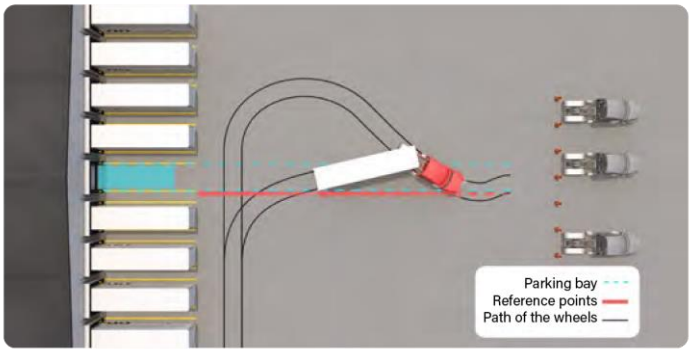
- Post-trip inspection of the road tractor
- Roll up the side windows.
- Walk around the road tractor to check the lights, tires, cargo securement, etc.
- Plug in or program the engine heater or cab heater during cold weather.
- Shut down all systems and lock the vehicle.

Assessing the Space Available Before Backing Up

Before backing up, you must assess the situation in order to determine the best approach, based on the space available. The following examples illustrate three common situations you will face when backing up.

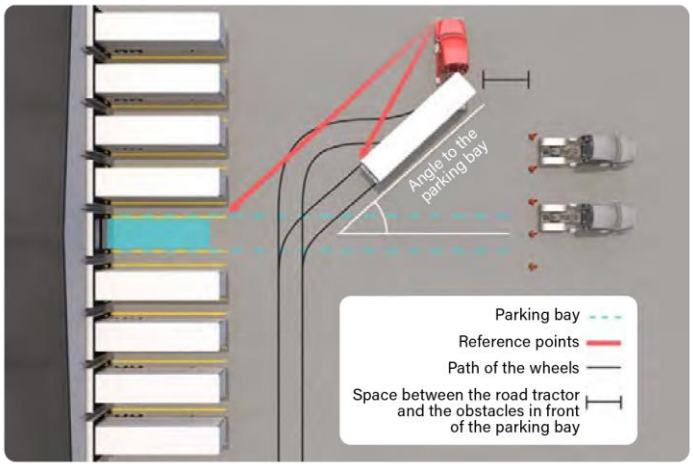
1 There is enough space in front of the parking bay to back up in a straight line

Where you start positioning the vehicle for backing up will depend on a variety of considerations, such as the length and position of the semi-trailer's rear axle and the position of the fifth wheel. When you finish positioning the vehicle for backing up, the road tractor should be aligned with the semi-trailer so that you can see your reference points and the parking bay you will be backing into in both side mirrors. Backing up in a straight line is covered in Exercise 7.18.



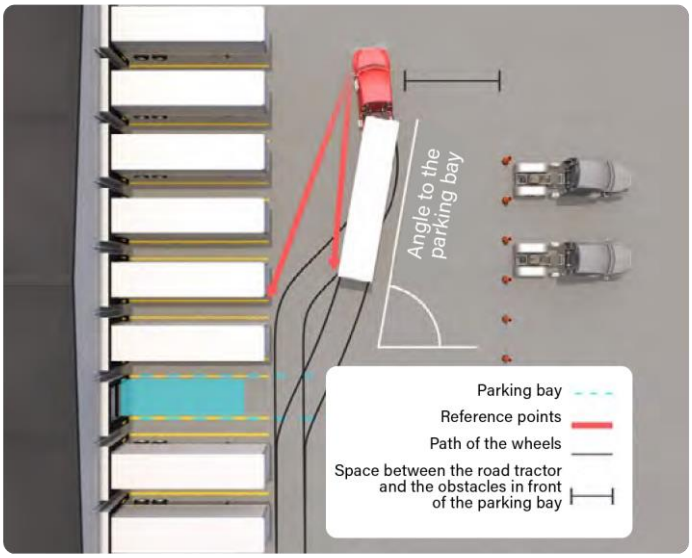
2 There is not enough space in front of the parking bay to back up in a straight line

In this type of situation, you must position the semi-trailer so that you begin backing up when it is at a 45-degree angle to the parking bay. The road tractor should also be at an angle to the semi-trailer so that you can see the parking bay and your reference points in your left side mirror. **Backing up at a 45-degree angle** from the left is covered in Exercise 7.19.



3 There is limited space in front of the parking bay

In this type of situation, you must position the semi-trailer so that you begin backing up when it is close to a 90-degree angle to the parking bay. It is also important to position the road tractor at a slight angle to the semi-trailer so that you can see the parking bay and the reference points in your left side mirror. **Backing up at a 90-degree angle** from the left is covered in Exercise 8.9 (Chapter 8).

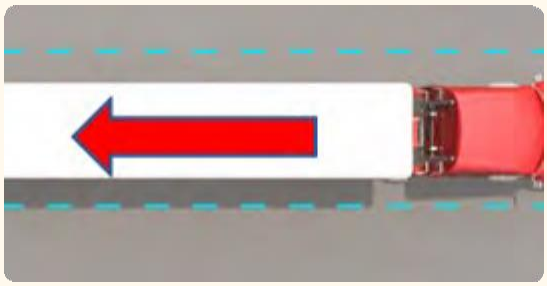


Although this is called backing up at a **90-degree angle**, you should begin backing up at a slight angle to the parking bay and allow yourself some extra buffer room on the passenger side of the road tractor.

Backing Up a Semi-Trailer in a Straight Line

Exercise 7.16

- **Competency component:** 7.2
- **Time required:** 30 minutes
- **Frequency:** Once



Overview

Summary

You will back up a semi-trailer in a straight line.

Learning Objectives

Knowledge and abilities:

- Develop your observation skills using your side mirrors.
- Control the semi-trailer by watching its progress in the side mirrors.
- Keep the semi-trailer on a straight path while avoiding overcorrecting with the steering wheel.

Soft skills:

- Be aware of the danger to other road users when you are backing up.

Exercise

Learning Environment

Where:

- Safe practice area

What you will need:

- Semi-trailer truck

Preparation

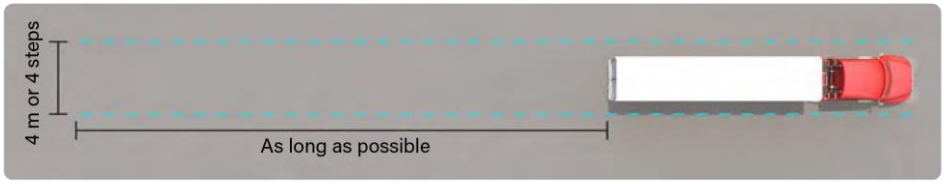
Tasks to complete beforehand:

- Review the notions regarding backing up (Chapter 4).
- Have completed the exercises that involve backing up while unhitched (Exercises 7.7 and 7.8).

Appendix

1) Assess the situation.
2) Identify reference points on the semi-trailer and in the space you will be backing into.
3) Regularly check both side mirrors in order to keep a close eye on both sides of the semi-trailer and the space you are backing into.
4) Back up using the steering wheel to guide the semi-trailer.

The faster you switch your attention between the two side mirrors, the sooner you will notice any adjustments that may be necessary. When you catch errors early on, they are smaller and easier to correct.



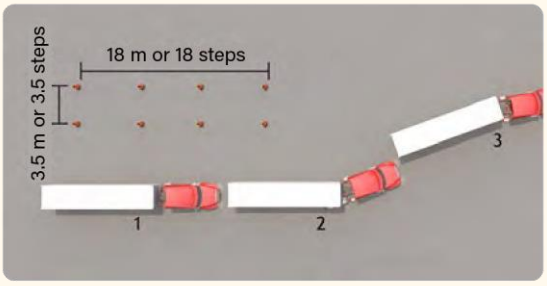
Abilities

- Lower your window.
- Use a lower engine speed.
- Do not accelerate.
- Activate your hazard lights.

Backing Up to the Side With a Semi-Trailer

Exercise 7.17

- **Competency component:** 7.2
- **Time required:** 30 minutes
- **Frequency:** Twice



Overview

Summary

You will back up to the side with a semi-trailer.

Learning Objectives

Knowledge and abilities:

- Keep your eye on a reference point in your side mirrors while backing up to the side.
- Line up the road tractor and semi-trailer in front of the parking bay.
- Back the semi-trailer truck into the parking bay while regularly monitoring both side mirrors.

Soft skills:

- Be aware of your surroundings in order to ensure the safety of other road users.

Exercise

Learning Environment

Where:

- Safe practice area
- Parking bay or the equivalent (cones)

What you will need:

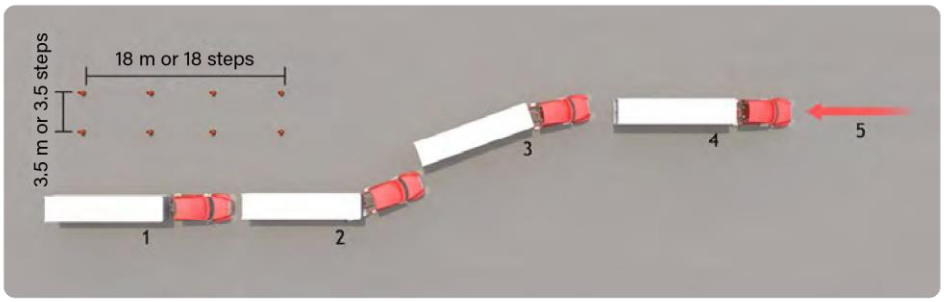
- Semi-trailer truck
- Cones (if no parking bay)

Preparation

Tasks to complete beforehand:

- Review the notions regarding backing up (Chapter 4).
- Have completed the exercises that involve backing up while unhitched (Exercises 7.7 and 7.8).
- Have mastered backing up a semi-trailer in a straight line (Exercise 7.16).

Appendix



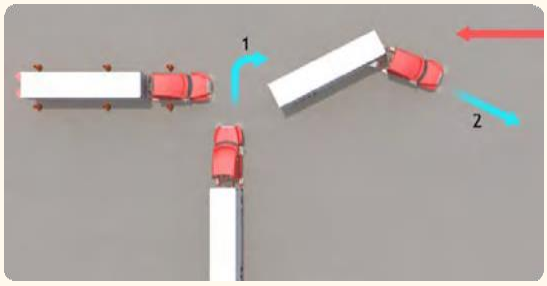
Abilities

- Lower your window.
- Use a lower engine speed.
- Do not accelerate.
- Activate your hazard lights.

Positioning a Semi-Trailer for Backing Up in a Straight Line

Exercise 7.18

- **Competency component:** 7.2
- **Time required:** 1 hour
- **Frequency:** Twice (the second time with a vehicle with an automatic transmission)



Overview

Summary

You will position a semi-trailer for backing up in a straight line.

Learning Objectives

Knowledge and abilities:

- Position the semi-trailer truck so that it is ready to begin backing up by keeping track of a reference point in your side mirrors.
- Line up the road tractor and semi-trailer in front of the parking bay.
- Back the semi-trailer truck into the parking bay while regularly monitoring both side mirrors.

Soft skills:

- Be aware of your surroundings in order to ensure the safety of other road users.
- Be able to manage your emotions and stress when carrying out driving manoeuvres.

Exercise

Learning Environment

Where:

- Safe practice area
- Parking bay or the equivalent (cones)

What you will need:

- Semi-trailer truck
- Cones (if no parking bay)

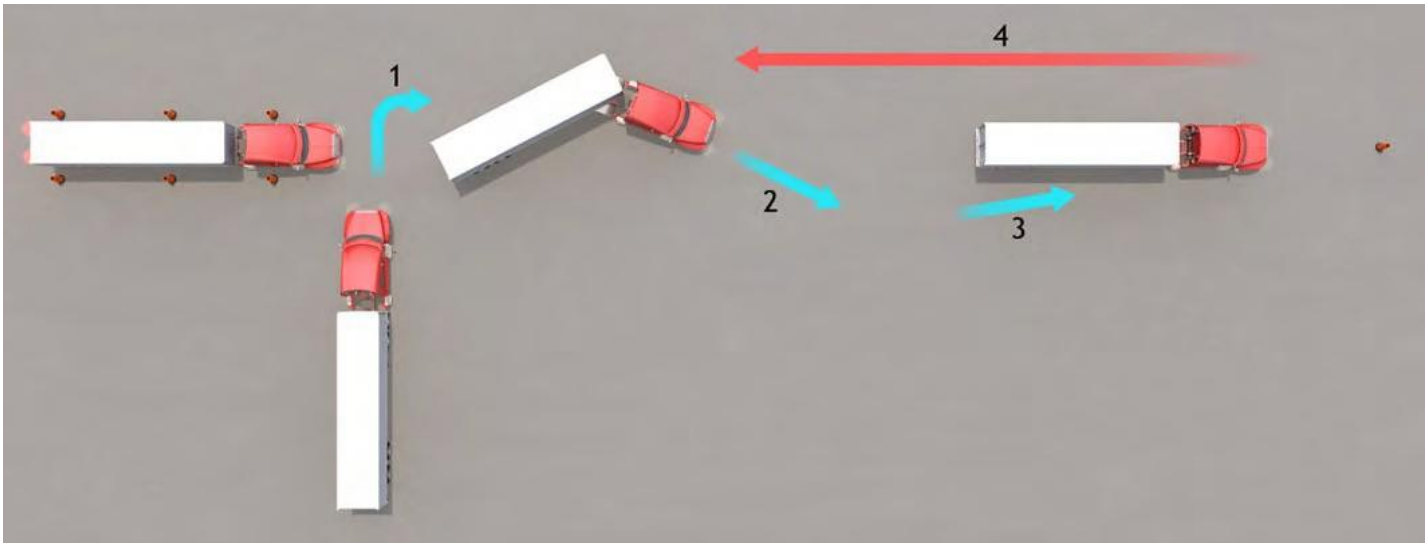
Preparation

Tasks to complete beforehand:

- Review the notions regarding backing up (Chapter 4).
- Have completed the exercises that involve backing up while unhitched (Exercises 7.7 and 7.8).
- Have mastered backing up a semi-trailer in a straight line (Exercise 7.16).
- Watch the video on backing up.

Appendix

1) Assess the situation and identify reference points on the semi-trailer and in the parking bay.
2) Identify any risks, obstacles and potential hazards.
3) Head toward the reference points you will use to properly position the vehicle for backing up.
4) Stop when you can see the parking bay in both side mirrors.
5) Use the side mirrors to observe the parking bay.
6) Back up while using the steering wheel to guide the semi-trailer.
7) Regularly check both side mirrors in order to keep a close eye on both sides of the semi-trailer and the space you are backing into.



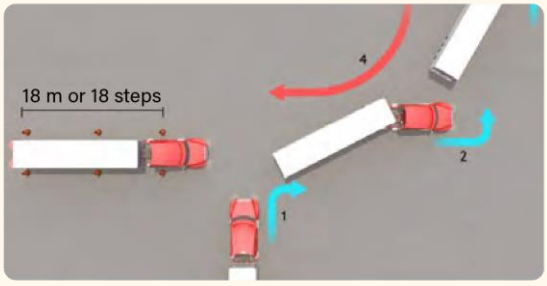
Abilities

› Lower your window.
› Use a lower engine speed.
› Do not accelerate.
› Activate your hazard lights.

Backing Up a Semi-Trailer at a 45-Degree Angle (From the Left)

Exercise 7.19

- **Competency component:** 7.2
- **Time required:** 1 hour
- **Frequency:** Three times (and an extra half-exercise for a vehicle with an automatic transmission)



Overview

Summary

You will position the semi-trailer at an angle in preparation for backing up. While backing up, you will slowly straighten out the semi-trailer and finish the manoeuvre by backing up in a straight line.

Learning Objectives

Knowledge and abilities:

- Keep track of the reference point in your side mirrors while backing up at an angle.
- Continue backing up until you have aligned the road tractor and semi-trailer in a straight line in front of the parking bay.
- Back the semi-trailer truck into the parking bay while regularly checking your side mirrors.

Soft skills:

- Be aware of your surroundings in order to ensure the safety of other road users.
- Persevere when practicing backing up manoeuvres.
- Be honest and transparent when completing your self-evaluation.

Exercise

Learning Environment

Where:

- Safe practice area
- Parking bay or the equivalent (cones)

What you will need:

- Semi-trailer truck
- Self-evaluation
- Cones (if no parking bay)

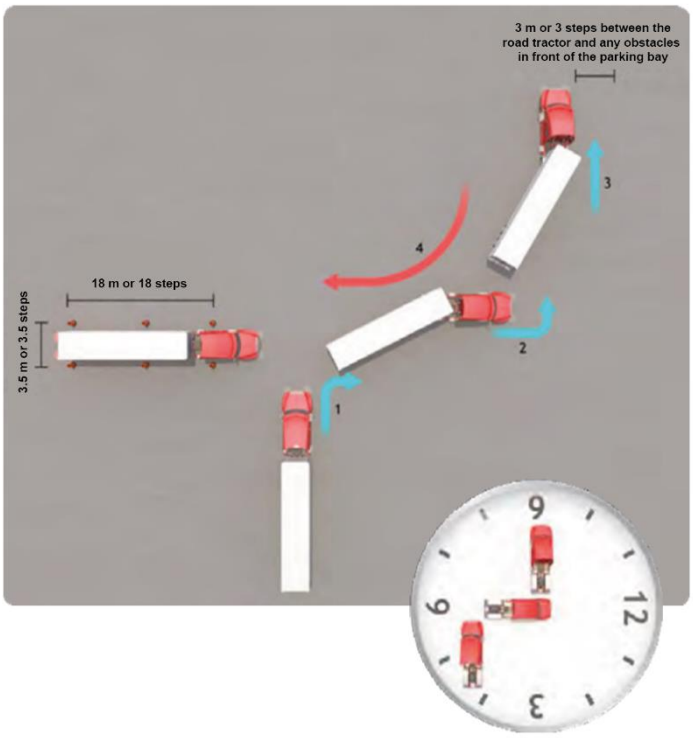
Preparation

Tasks to complete beforehand:

- Review the notions regarding backing up (Chapter 4).
- Have completed the exercises that involve backing up while unhitched (Exercises 7.7 and 7.8).
- Have mastered backing up a semi-trailer (Exercises 7.16, 7.17 and 7.18).

Appendix

1) Assess the situation.
2) Identify two reference points: one directly in front of the parking space (at noon), and the other perpendicular to the parking space (at 9 o'clock).
3) Identify any risks, obstacles and potential hazards.
4) Head toward the first reference point (at noon).
5) Turn the steering wheel to head toward the second reference point (at 9 o'clock).
6) Locate the parking bay in your left side mirror.
7) Stop when the semi-trailer is in a good position to begin backing up.
8) Back up into the parking space, using the steering wheel to properly align the semi-trailer.
9) Regularly check both side mirrors in order to keep a close eye on both sides of the semi-trailer and the space you are backing into.



Abilities

› Lower your window.
› Use a lower engine speed.
› Do not accelerate.
› Activate your hazard lights.

This exercise can be done at a loading dock if one is available. To successfully complete this exercise, you must back up so that the semi-trailer is centred between the loading dock pads and perpendicular to the loading dock wall.

Tips

If there are no pavement markings to help you line up the semi-trailer when backing up:

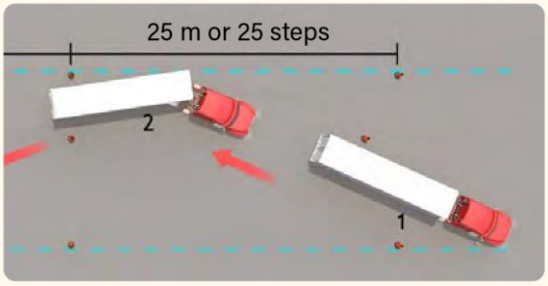
› Fill two thirds of an empty windshield washer fluid container with sand. This will help you align yourself perpendicular to the wall.

Obtain authorization before backing up and avoid touching the loading dock or the loading dock pads to avoid causing any damage.

Serpentine Backing Up With a Semi-Trailer

Exercise 7.20

- **Competency component:** 7.2
- **Time required:** No set time
- **Frequency:** As required, based on the time available



Overview

Summary

- You will manoeuvre the semi-trailer to the left and right while backing up.

Learning Objectives

Knowledge and abilities:

- Practice controlling the semi-trailer while backing up and manoeuvring between obstacles.
- Guide the semi-trailer truck where you want it to go, while avoiding overcorrecting with the steering wheel.
- Develop a better understanding of the role your side mirrors play and use them more effectively.

Soft skills:

- Be aware of your surroundings and of the danger a moving semi-trailer truck can represent to other road users and yourself.

Exercise

Learning Environment

Where:

- Safe practice area

What you will need:

- Semi-trailer truck
- Cones

Preparation

Tasks to complete beforehand:

- Review the notions regarding backing up (Chapter 4).
- Have completed the exercises that involve backing up while unhitched (Exercises 7.7 and 7.8).
- Have mastered backing up a semi-trailer (Exercises 7.18 and 7.19).

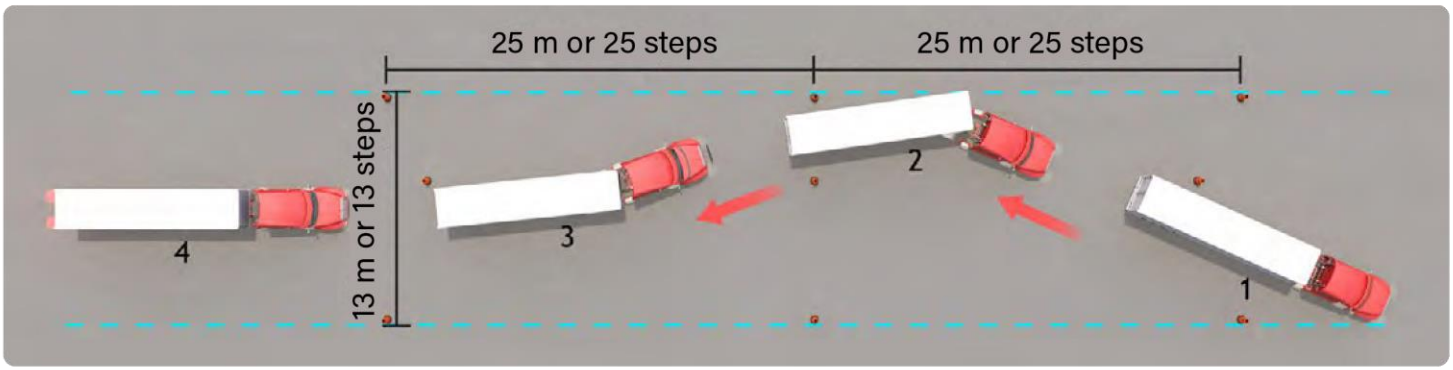
Appendix

1) Assess the situation and identify reference points on the semi-trailer and in the space you are backing towards.
2) Use your side mirrors to maintain visual contact with your reference points and the space you are headed towards.
3) Back up using controlled movements of the steering wheel.
4) Regularly check both side mirrors in order to keep a close eye on both sides of the semi-trailer and the space you are backing into.

Video included with the training material

Second part of the video (5:20 to 8:29):

www.youtube.com/watch?v=a81mL1Qr0PI&t=22s (in French only)



Abilities

- Lower your window.
- Use a lower engine speed.
- Do not accelerate.
- Activate your hazard lights.

Exercise Log
(Manual Transmission)

Exercise	Exercise Number	Time Required	Frequency						Total Time Allocated	Actual Number of Hours
			1	2	3	4	5	6		
Pre-driving adjustments and starting the vehicle	7.1	30 min	◉	▲	▲	▲	▲	▲	0.5	
Learning how to do a circle check of a road tractor	7.2	1.5 h	◉						1.5	
Doing a circle check of a road tractor	7.3	30 min	◉						0.5	
Gear shift pattern and friction point basics	7.4	30 min	◉	▲	▲	▲	▲	▲	0.5	
Upshifting through the lower gears	7.5	30 min	◉	▲	▲	▲	▲	▲	0.5	
Downshifting	7.6	1.5 h	◉	▲	▲	▲	▲	▲	1.5	
Serpentine backing up while unhitched	7.7	30 min	◉						0.5	
Backing up to position a road tractor for hitching	7.8	30 min	◉	▲	▲	▲	▲	▲	0.5	
Learning how to hitch a semi-trailer	7.9	30 min	◉						0.5	
Learning how to do a circle check of a semi-trailer truck	7.10	30 min	◉						0.5	
Learning how to unhitch a semi-trailer	7.11	30 min	◉						0.5	
Hitching a semi-trailer	7.12	30 min	◉	▲	▲	▲	▲	▲	0.5	
Doing a circle check of a semi-trailer truck	7.13	30 min	◉	◉	◉	◉	◉	◉	3	
Unhitching a semi-trailer	7.14	30 min	◉	▲	▲	▲	▲	▲	0.5	
Parking (post-trip inspection)	7.15A	5 min	◉	▲	▲	▲	▲	▲	0.083	
Backing up a semi-trailer in a straight line	7.16	30 min	◉						0.5	
Backing up to the side with a semi-trailer	7.17	30 min	◉	◉					1	
Positioning a semi-trailer for backing up in a straight line	7.18	1 h	◉	◉					2	
Backing up a semi-trailer at a 45-degree angle (from the left)	7.19	1 h	◉	◉	◉				3	
Serpentine backing up with a semi-trailer (enrichment)	7.20	1 h	▽							
Self-evaluation (included with exercise 7.19)			◉							
Total									**18.083**	

◉ Mandatory exercise

▲ Exercise repeated throughout the in-vehicle training

▽ Enrichment exercise

Exercise Log
(Automatic Transmission)

Exercise	Exercise Number	Time Required	Frequency						Total Time Allocated	Actual Number of Hours
			1	2	3	4	5	6		
Pre-driving adjustments and starting the vehicle	7.1	30 min	◉	▲	▲	▲	▲	▲	0.5	
Learning how to do a circle check of a road tractor	7.2	1.5 h	◉						1.5	
Doing a circle check of a road tractor	7.3	30 min	◉						0.5	
Using an automatic or automated manual transmission	7.4A	60 min	◉						1	
Serpentine backing up while unhitched	7.7	30 min	◉						0.5	
Backing up to position a road tractor for hitching	7.8	30 min	◉	▲	▲	▲	▲	▲	0.5	
Learning how to hitch a semi-trailer	7.9	30 min	◉						0.5	
Learning how to do a circle check of a semi-trailer truck	7.10	30 min	◉						0.5	
Learning how to unhitch a semi-trailer	7.11	30 min	◉						0.5	
Hitching a semi-trailer	7.12	30 min	◉	▲	▲	▲	▲	▲	0.5	
Doing a circle check of a semi-trailer truck	7.13	30 min	◉	◉	◉	◉	◉	◉	3	
Unhitching a semi-trailer	7.14	30 min	◉	▲	▲	▲	▲	▲	0.5	
Parking (post-trip inspection)	7.15A	5 min	◉	▲	▲	▲	▲	▲	0.083	
Backing up a semi-trailer in a straight line	7.16	30 min	◉						0.5	
Backing up to the side with a semi-trailer	7.17	30 min	◉	◉					1	
Positioning a semi-trailer for backing up in a straight line	7.18	1 h	◉	◉	◆				3	
Backing up a semi-trailer at a 45-degree angle (from the left)	7.19	1 h	◉	◉	◉	◆			3.5	
Serpentine backing up with a semi-trailer (enrichment)	7.20	1 h	▽							
Self-evaluation (included with exercise 7.19)			◉							
Total									**18.083**	

◉ Mandatory exercise

▲ Exercise repeated throughout the in-vehicle training

▽ Enrichment exercise

◆ Additional 90 minutes for automatic transmissions

Competency 7 Self-Evaluation No. 1

Basic Manoeuvres

Student name:

Date:

Legend
1: No mastery **2:** Poor mastery **3:** Good mastery **4:** Confident mastery

Competency Statement Manoeuvre a Semi-Trailer Truck		**Student** Self-Evaluation			
Competency Component	**Performance Criteria**	**1**	**2**	**3**	**4**
Prepare the semi-trailer truck for driving manoeuvres	**Circle check carried out properly**				
	› Inspection of all components covered by the circle check	○	○	○	○
	› Comprehensive inspection of the brake system	○	○	○	○
	› Completion within a reasonable amount of time	○	○	○	○
	Cargo securement system fully inspected				
	› Safe and adequate inspection method	○	○	○	○
	Pre-driving adjustments properly carried out				
	› Ergonomic positioning of the seat and steering wheel	○	○	○	○
	› Proper adjusting of the mirrors	○	○	○	○
Hitch and unhitch a semi-trailer	**Semi-trailer hitched using the proper technique**				
	› Smooth and controlled steering without overcorrecting	○	○	○	○
	› Following of steps and procedures	○	○	○	○
	› Use of safe techniques	○	○	○	○
	› Completion within a reasonable amount of time	○	○	○	○
	› Safe manoeuvring (window lowered and use of turn-signal lights)	○	○	○	○
	Semi-trailer unhitched using the proper technique				
	› Following of steps and procedures	○	○	○	○
	› Dumping of the semi-trailer's air suspension	○	○	○	○
	› Proper positioning of the landing gear	○	○	○	○
	› Use of safe techniques	○	○	○	○

Legend
1: No mastery **2:** Poor mastery **3:** Good mastery **4:** Confident mastery

Competency Statement Manoeuvre a Semi-Trailer Truck		**Student** Self-Evaluation			
Competency Component	**Performance Criteria**	**1**	**2**	**3**	**4**
Perform basic driving manoeuvres with a semi-trailer truck	**Proper technique used when backing up in a straight line or to the side**				
	• Lowering of the window	○	○	○	○
	• Use of turn-signal lights	○	○	○	○
	• Use of side mirrors	○	○	○	○
	• Appropriate and controlled use of accelerator when backing up	○	○	○	○
	• Controlled steering of the semi-trailer in the right direction	○	○	○	○
	• Good control of the steering wheel	○	○	○	○
	Proper technique used when setting the vehicle in motion				
	• Location of the friction point	○	○	○	○
	• Memorization of the gear shift pattern	○	○	○	○
	• Use of the double-clutching technique	○	○	○	○
	• Use of the proper upshifting technique	○	○	○	○
	• Use of the proper downshifting technique	○	○	○	○
	• Overall control of the vehicle	○	○	○	○

Fill out your self-evaluation as soon as possible after completing the related exercises, while everything is still fresh in your memory.

Refer to the appropriate circle check sheet in Appendix 2.

Competency 7 Self-Evaluation No. 2

Basic Manoeuvres

Student name:

Date:

Legend
1: No mastery **2:** Poor mastery **3:** Good mastery **4:** Confident mastery

Competency Statement Manoeuvre a Semi-Trailer Truck		**Student** Self-Evaluation			
Competency Component	**Performance Criteria**	**1**	**2**	**3**	**4**
Prepare the semi-trailer truck for driving manoeuvres	**Circle check carried out properly**				
	› Inspection of all components covered by the circle check	◯	◯	◯	◯
	› Comprehensive inspection of the brake system	◯	◯	◯	◯
	› Completion within a reasonable amount of time	◯	◯	◯	◯
	Cargo securement system fully inspected				
	› Safe and adequate inspection method	◯	◯	◯	◯
	Pre-driving adjustments properly carried out				
	› Ergonomic positioning of the seat and steering wheel	◯	◯	◯	◯
	› Proper adjusting of the mirrors	◯	◯	◯	◯
Hitch and unhitch a semi-trailer	**Semi-trailer hitched using the proper technique**				
	› Smooth and controlled steering without overcorrecting	◯	◯	◯	◯
	› Following of steps and procedures	◯	◯	◯	◯
	› Use of safe techniques	◯	◯	◯	◯
	› Completion within a reasonable amount of time	◯	◯	◯	◯
	› Safe manoeuvring (window lowered and use of turn-signal lights)	◯	◯	◯	◯
	Semi-trailer unhitched using the proper technique				
	› Following of steps and procedures	◯	◯	◯	◯
	› Dumping of the semi-trailer's air suspension	◯	◯	◯	◯
	› Proper positioning of the landing gear	◯	◯	◯	◯
	› Use of safe techniques	◯	◯	◯	◯

Legend
1: No mastery **2:** Poor mastery **3:** Good mastery **4:** Confident mastery

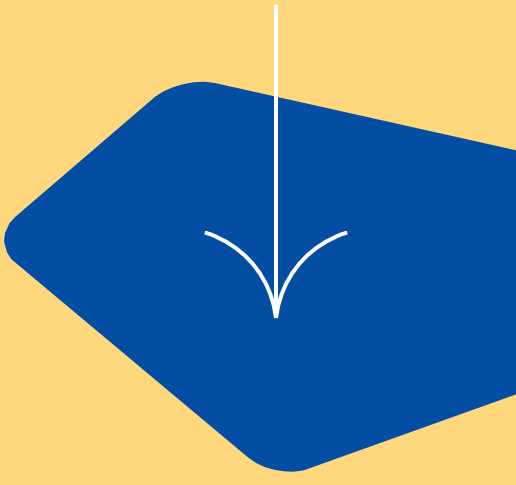
Competency Statement Manoeuvre a Semi-Trailer Truck		**Student** Self-Evaluation			
Competency Component	**Performance Criteria**	**1**	**2**	**3**	**4**
Perform basic driving manoeuvres with a semi-trailer truck	**Proper technique used when backing up in a straight line or to the side**				
	• Lowering of the window	○	○	○	○
	• Use of turn-signal lights	○	○	○	○
	• Use of side mirrors	○	○	○	○
	• Appropriate and controlled use of accelerator when backing up	○	○	○	○
	• Controlled steering of the semi-trailer in the right direction	○	○	○	○
	• Good control of the steering wheel	○	○	○	○
	Proper technique used when setting the vehicle in motion				
	• Location of the friction point	○	○	○	○
	• Memorization of the gear shift pattern	○	○	○	○
	• Use of the double-clutching technique	○	○	○	○
	• Use of the proper upshifting technique	○	○	○	○
	• Use of the proper downshifting technique	○	○	○	○
	• Overall control of the vehicle	○	○	○	○

Fill out your self-evaluation as soon as possible after completing the related exercises, while everything is still fresh in your memory.

Refer to the appropriate circle check sheet in Appendix 2.

Chapter 8

Driving on the Road Network



This chapter contains a series of exercises to help you acquire the knowledge and practice the skills that are essential to driving a heavy vehicle on the road network. These exercises can be done in the order presented, or switched around to suit your learning path or accommodate any logistical considerations. They can also be grouped together when planning lessons in safe practice areas or on the road network. For instance, a three-hour lesson at the wheel of a heavy vehicle could include several exercises.

Each exercise sheet includes the following: a summary of the exercise, a list of the learning objectives, a description of the learning environment and any tasks to be completed beforehand to help you prepare. Some exercise sheets include an appendix containing useful tips or specific instructions.

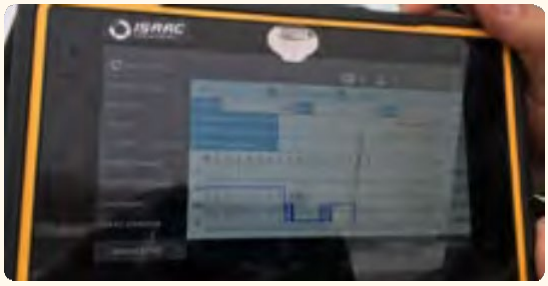
The knowledge, abilities and soft skills you have already acquired will be put to use during these exercises. The soft skills described in the exercise sheets correspond to the attitudes and behaviours that are expected of you.

The exercise sheets are followed by a table where you can log your hours and track your progress toward meeting the requirements of the Class 1 RSEP training course. The table is followed by several self-evaluations. Your instructor will let you know when you must complete them.

Using an Electronic Logging Device

Exercise 8.1

- **Competency components:** 8.1 and 8.3
- **Time required:** 15 minutes
- **Frequency:** During every driving exercise



Overview

Summary

You must show that you are able to enter every change of duty status in an electronic logging device (ELD) throughout the day in real time. You must enter the time at which each duty status begins and ends, and then complete and sign the record of duty status electronically. Your instructor will have already demonstrated how to use the ELD.

Learning Objectives

Knowledge and abilities:

- Complete your record of duty status using the ELD.
- Work on remembering to change your duty status when required so that it becomes second nature.
- Comply with the requirements of the *Regulation respecting the hours of driving and rest of heavy vehicle drivers*.

Soft skills:

- Understand the importance of complying with the *Regulation respecting the hours of driving and rest of heavy vehicle drivers*.

Exercise

Learning Environment

Where:

- During every driving exercise, regardless of where it takes place

What you will need:

- Road tractor
- Electronic logging device

Preparation

Tasks to complete beforehand:

- Review the information about hours of driving and off-duty time (Chapter 3).
- Attend the ELD demonstration given by your instructor (Chapter 4).

Appendix

Don’t forget! Using an ELD to complete your record of duty status is mandatory.

Doing a Circle Check of a Semi-Trailer Truck

Exercise 8.2

- **Competency component:** 8.1
- **Time required:** 20 minutes
- **Frequency:** Before each work shift and at least once every 24 hours

Overview

Summary

You will carry out a circle check of a loaded semi-trailer and also verify that its cargo is properly secured. The first few times you do this, you may take the time you need to properly master each step. After that, your instructor will give you a reasonable amount of time (about 20 minutes) to complete the circle check and verify that the cargo is properly secured.

Learning Objectives

Knowledge and abilities:

- Do a circle check of a loaded semi-trailer.
- Identify any minor or major defects found while inspecting the components.
- Complete the circle check and verify the cargo securement system in 20 minutes.
- Inspect the tiedown devices.

Soft skills:

- Understand the importance of wearing protective gear and using three support points to climb in and out of the vehicle.

Exercise

Learning Environment

Where:

- Safe practice area

What you will need:

- Loaded semi-trailer truck
- Hand tools
- Protective gear
- List of defects for heavy vehicles (List 1 in the *Circle Check Guide)*
- List of components to inspect
- Watch or stopwatch

Preparation

Tasks to complete beforehand:

- Review the appropriate circle check method (Chapter 6).
- Have completed a circle check (Chapter 7, Exercise 7.10).
- Watch the video on the circle check.

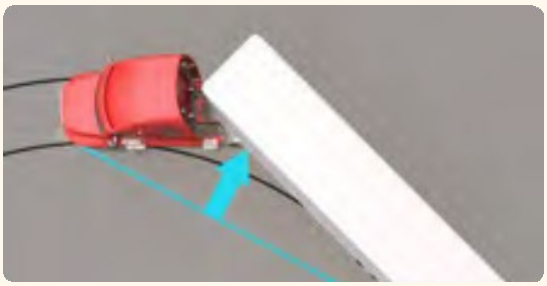
Appendix

Your instructor will provide feedback.

Backing Up a Semi-Trailer at a 45-Degree Angle From the Left

Exercise 8.3

- **Competency component:** 8.2
- **Time required:** 5 minutes
- **Frequency:** Every on-road exercise



Overview

Summary

You will back up a semi-trailer truck at a 45-degree angle. This can be done at a loading dock or a parking bay.

Learning Objectives

Knowledge and abilities:

- Identify the reference points that will allow you to position your vehicle before backing up.
- Use your mirrors to help you keep the semi-trailer properly aligned and avoid obstacles while backing up.
- Maintain the proper angle between the road tractor and the semi-trailer while avoiding overcorrecting with the steering wheel.

Soft skills:

- Understand that this is a manoeuvre you will often have to perform as a heavy vehicle driver, and that you will need to take the safety of other road users into account when doing so.

Exercise

Learning Environment

Where:

- During every driving exercise, regardless of where it takes place
- Parking bay, unloading dock or the equivalent (cones)

What you will need:

- Semi-trailer truck
- Cones (if no parking bay)

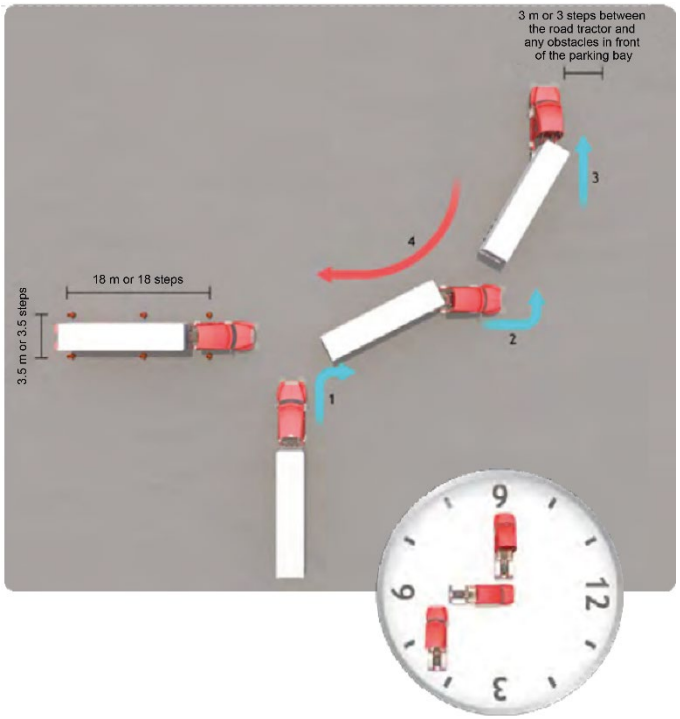
Preparation

Tasks to complete beforehand:

- Master backing up with a semi-trailer, both in a straight line and at an angle (Exercises 7.16 and 7.19).
- Carefully study the appendix included with this exercise sheet.

Appendix

1) Assess the situation.
2) Identify two reference points: one directly in front of the parking space (at noon), and the other perpendicular to the parking space (at 9 o'clock).
3) Identify any risks, obstacles and potential hazards.
4) Head toward the first reference point (at noon).
5) Turn the steering wheel to head toward the second reference point (at 9 o'clock).
6) Locate the parking bay in your left side mirror.
7) Stop when the semi-trailer is in a good position to begin backing up.
8) Back up into the parking space, using the steering wheel to properly align the semi-trailer.
9) Regularly check both side mirrors in order to keep a close eye on both sides of the semi-trailer and the space you are backing into.



Abilities

› Lower your window.
› Use a lower engine speed.
› Do not accelerate.
› Activate your hazard lights.

This exercise can be done at a loading dock if one is available. To successfully complete this exercise, you must back up so that the semi-trailer is centred between the loading dock pads and perpendicular to the loading dock wall.

Tips

If there are no pavement markings to help you line up the semi-trailer when backing up:

› Fill two thirds of an empty windshield washer fluid container with sand. This will help you align yourself perpendicular to the wall.

Obtain authorization before backing up and avoid touching the loading dock or the loading dock pads to avoid causing any damage.

Learning to Drive on the Road

Exercise 8.4

- **Competency component:** 8.2
- **Time required:** 1 hour
- **Frequency:** Three times

Overview

Summary

You will drive a semi-trailer truck in an area where it is easy to start learning to drive on roads. This will be your first experience driving on the road network.

Learning Objectives

Knowledge and abilities:

- Manoeuvre a semi-trailer truck.
- Upshift and downshift using the appropriate technique, if applicable.
- Become familiar with how best to negotiate left and right curves, including what to do when entering and exiting a curve.
- Develop your observation skills when it comes to scanning your surroundings.
- Abide by the *Highway Safety Code*.

Depending on the type of transmission:

- Test out driving at various speeds and shifting gears, which should be done each time your speed increases by 20 km/h.

Soft skills:

- Drive safely, cooperatively and responsibly.
- Be aware of the importance of regularly checking your side mirrors when driving.

Grab the gear selector, place your foot on the clutch pedal and keep the engine speed stable.

Exercise

Learning Environment

Where:

- Calm area with little traffic where it will be easy to begin learning, such as an industrial park or country roads
- Roads where the speed limit is 50 km/h or less
- Roads with wide or double lanes
- Area where it is easy to turn
- Area without any dead ends

What you will need:

- Semi-trailer truck
- Electronic logging device

Preparation

Tasks to complete beforehand:

- Review the laws and regulations that apply to driving a heavy vehicle (Chapter 3).
- Review the notions on basic driving manoeuvres (Chapter 4).
- Review the exercises on gear shift patterns and the friction point (Exercises 7.4, 7.5 and 7.6).

Being Vigilant When Driving in Cities

Exercise 8.5

- **Competency component:** 8.2
- **Time required:** 1 hour
- **Frequency:** Three times

Overview

Summary

You will drive a loaded semi-trailer truck in an urban setting with few or no turns.

Learning Objectives

Knowledge and abilities:

- Apply urban driving techniques.
- Be prepared to stop at traffic lights and always keep an eye out for road signs, pavement markings and traffic signals.
- If your vehicle is equipped with left and right convex mirrors, check them regularly to spot any road users or obstacles in your blind spots.
- Abide by the *Highway Safety Code*.

Depending on the type of transmission:

- Note at what speed a change of gear is required.
  .

Soft skills:

- Drive safely, cooperatively and responsibly, especially when it comes to checking your vehicle's blind spots.

Exercise

Learning Environment

Where:

- Streets with several intersections, stop signs and traffic lights
- Streets with a speed limit of 50 km/h or less
- Planned route that is long enough to require shifting gears but avoids making turns at intersections
- Access to a safe space where you can stop the vehicle and speak with your instructor
- Area and route providing a variety of driving situations, including during rush hour and at night (this activity will be done three times to allow for this)

What you will need:

- Loaded semi-trailer truck
- Electronic logging device
- Self-evaluation sheet

Preparation

Tasks to complete beforehand:

- Review the laws and regulations that apply to driving a heavy vehicle (Chapter 3).
- Review the notions on basic driving manoeuvres (Chapter 4).
- Review upshifting and downshifting (Chapter 7 and Exercises 7.4, 7.5 and 7.6).

Normal City Driving

Exercise 8.6

- **Competency component:** 8.2
- **Time required:** 2 hours
- **Frequency:** Twice

Overview

Summary

You will carry out various driving manoeuvres in an urban setting with a loaded semi-trailer truck.

Learning Objectives

Knowledge and abilities:

- Manoeuvre a semi-trailer truck in an urban setting under normal driving conditions.
- Make straightforward left and right turns at intersections (turns of 90° or more).
- Perform driving manoeuvres while observing your surroundings.

Depending on the type of transmission:

- Change gears as needed based on the speed of the vehicle.

Soft skills:

- Drive safely, cooperatively and responsibly.
- Be aware of the dangers involved in city driving.
- Adopt eco-driving practices.

Exercise

Learning Environment

Where:

- A variety of city streets and boulevards where it is easy to practice turning at intersections
- Streets presenting different configurations (one or two lanes each way)
- Streets with a speed limit of 50 km/h or less
- Access to a safe space where you can stop the vehicle and speak with your instructor

What you will need:

- Loaded semi-trailer truck
- Electronic logging device
- Self-evaluation sheet

Preparation

Tasks to complete beforehand:

- Review the laws and regulations that apply to driving a heavy vehicle (Chapter 3).
- Review the notions on basic driving manoeuvres (Chapter 4).
- Review upshifting and downshifting (Chapter 7 and Exercises 7.4, 7.5 and 7.6).
- Review what you learned in previous exercises on the road network (Exercises 8.4 and 8.5).

Complex City Driving

Exercise 8.7

- **Competency component:** 8.2
- **Time required:** 1 hour
- **Frequency:** Once

Overview

Summary

You will carry out various driving manoeuvres in a complex urban setting with a loaded semi-trailer truck.

Learning Objectives 310

Knowledge and abilities:

- Use the driving techniques that apply when making complex or sharp (less than 90°) left and right turns (refer to the photos in the appendix).
- Pay attention to road signs, traffic signals and pavement markings in order to anticipate the configuration of a turn and adapt your driving technique accordingly.

Soft skills:

- Drive safely, cooperatively and responsibly, especially when it comes to checking your vehicle's blind spots.
- Be aware of the trajectory of the semi-trailer so as to avoid any potential obstacles (city infrastructure, curbs, etc.) and other road users (cyclists, pedestrians, etc.).
- Apply eco-driving techniques.

Exercise

Learning Environment

Where:

- Urban setting that includes left turns at intersections with two lanes of traffic and sharp curves (less than 90°)
- Narrow streets, if possible
- Streets with a speed limit of 50 km/h or less
- Access to a safe space where you can stop the vehicle and speak with your instructor

What you will need:

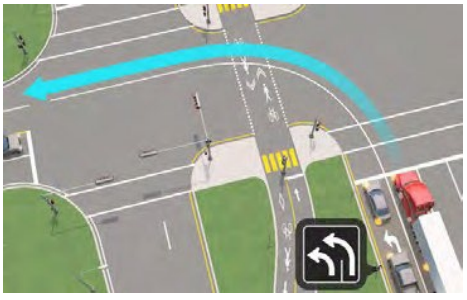
- Loaded semi-trailer truck
- Electronic logging device
- Self-evaluation sheet

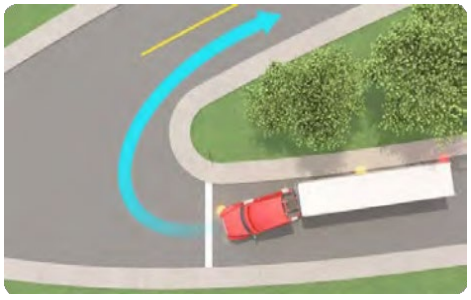
Preparation

Tasks to complete beforehand:

- Review the laws and regulations that apply to driving a heavy vehicle (Chapter 3).
- Review the notions on basic driving manoeuvres (Chapter 4).
- Review what you learned in the exercise on normal city driving (Exercise 8.6).

Appendix

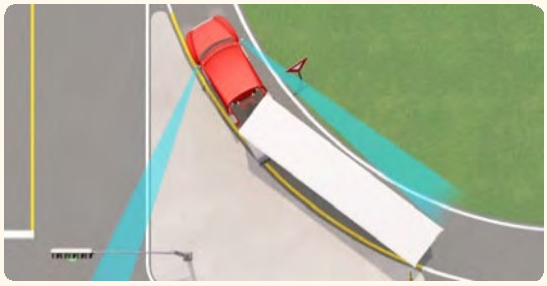




Merging Lanes in Cities

Exercise 8.8

- **Competency component:** 8.2
- **Time required:** 1 hour
- **Frequency:** Once



Overview

Summary

You will make at least three right turns with a loaded semi-trailer truck at intersections with a merge lane, which is a special situation you will encounter when driving in urban settings.

Learning Objectives

Knowledge and abilities:

- Make turns at intersections using a merge lane.
- Pay attention to road signs and pavement markings in order to have advance warning of right turns with a merge lane.
- Use the merge lane to turn right while paying attention to your surroundings and checking your blind spots (refer to the appendix).
- Obey the yield sign.

Soft skills:

- Be aware of the trajectory of the semi-trailer so as to avoid any potential obstacles (city infrastructure, curbs, etc.) and other road users (cyclists, pedestrians, etc.).

Exercise

Learning Environment

Where:

- Urban setting with right turns that use a merge lane with a yield sign
- Streets with a speed limit of 50 km/h or less
- Access to a safe space where you can stop the vehicle and speak with your instructor

What you will need:

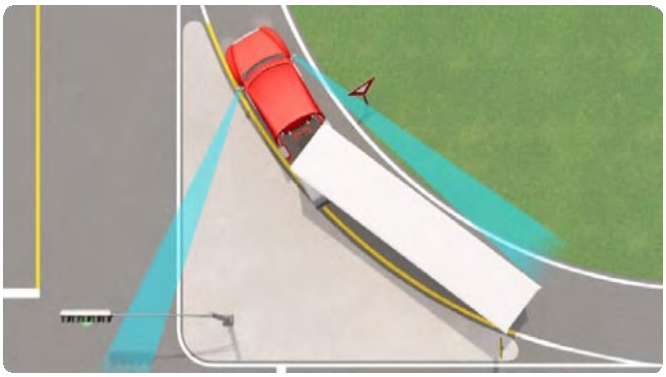
- Loaded semi-trailer truck
- Electronic logging device

Preparation

Tasks to complete beforehand:

- Review the laws and regulations that apply to driving a heavy vehicle (Chapter 3).
- Review the notions on basic driving manoeuvres (Chapter 4).
- Review what you learned in the exercises on normal and complex city driving (Exercises 8.6 and 8.7).

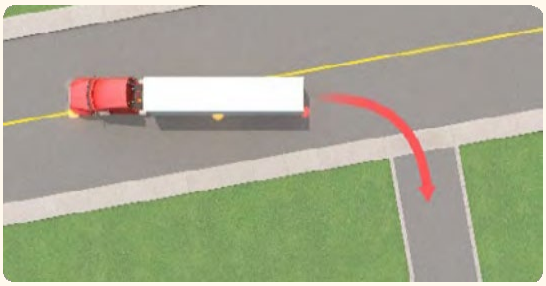
Appendix



Backing Up a Semi-Trailer at a 90-Degree Angle From the Left

Exercise 8.9

- **Competency component:** 8.2
- **Time required:** 1 hour
- **Frequency:** Once



Overview

Summary

You will position a semi-trailer at a 90-degree angle in preparation for backing into a parking bay or up to loading dock in a place where you have little room to manoeuvre, such as a street. You will then back the semi-trailer into the parking bay or up to the loading dock.

312

Learning Objectives

Knowledge and abilities:

- Back a semi-trailer into a parking bay or up to a loading dock.
- Use your side mirrors to make sure the semi-trailer and road tractor are properly aligned with the parking bay or loading dock while backing up.
- Develop your ability to efficiently manoeuvre a semi-trailer in tight spaces.

Soft skills:

- Be aware of the blind spots around the road tractor and semi-trailer.
- Use your judgment and show courtesy before blocking traffic so as to position your vehicle and back up.

Exercise

Learning Environment

Where:

- Safe, quiet area with little traffic where it is easy to practice backing up, such as an industrial park

What you will need:

- Semi-trailer truck
- Electronic logging device

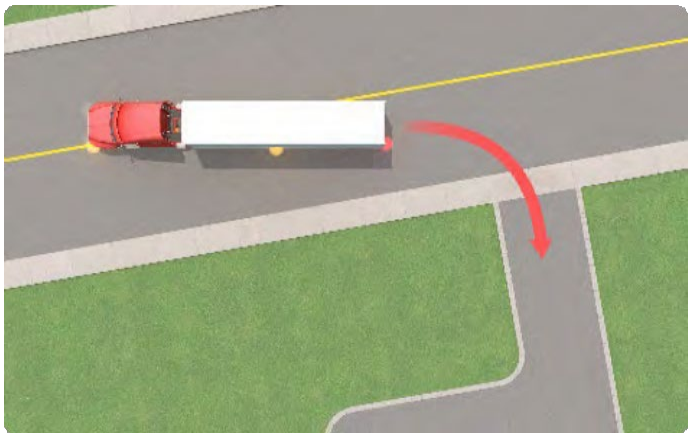
Preparation

Tasks to complete beforehand:

- Review backing up notions (Chapter 4).
- Review how to assess the space available before backing up (Chapter 7).
- Review what you have learned in all previous backing up exercises (Chapter 7).
- Review what you have learned about using your side mirrors and controlling the steering wheel (Exercise 7.7).

Appendix

1) Assess the situation.
2) Identify reference points on the semi-trailer and in the parking bay or loading dock.
3) Use your left side mirror to keep an eye on your reference points as you back up to align the semi-trailer with the bay or dock.
4) Back up steadily while controlling the steering wheel.
5) Once the trailer is aligned with the parking bay or loading dock, use your side mirrors to check both sides of the semi-trailer and the bay or dock as you back into place.



Let any approaching vehicles go by before blocking traffic as you position your vehicle and back up.

Driving on Limited-Access Highways

Exercise 8.10

- **Competency component:** 8.2
- **Time required:** 1 hour
- **Frequency:** Once

Overview

Summary

You will operate a loaded semi-trailer truck on a limited-access highway and practice handling the vehicle on entrance and exit ramps.

Learning Objectives

Knowledge and abilities:

- Develop your ability to merge in and out of the fast lane.
- Stay in your lane or change lanes without having to make abrupt steering corrections at high speed.
- Adjust the speed of the vehicle in anticipation of upcoming manoeuvres.
- Identify situations where you should use the supplemental brakes and follow the steps to activate them.
- Get into the habit of scanning your surroundings as far ahead as possible and checking your side mirrors.

Soft skills:

- Understand the importance of keeping your distance from other vehicles when travelling at high speeds.
- Be aware of the vehicle's side blind spots, as vehicles in adjacent lanes may be in them.

Exercise

Learning Environment

Where:

- Limited-access highway with a variety of entrance and exit ramp configurations
- Fast lanes with a speed limit of 100 km/h
- Access to a safe space where you can stop the vehicle and speak with your instructor

What you will need:

- Loaded semi-trailer truck
- Electronic logging device

Preparation

Tasks to complete beforehand:

- Review the laws and regulations that apply to driving a heavy vehicle (Chapter 3).
- Review the notions on basic driving manoeuvres (Chapter 4).
- Review all the basic driving manoeuvres you have practiced so far (Chapter 7).
- Review the exercise on merging in the context of city driving (Exercise 8.8).

Appendix

Take advantage of this exercise to practice using the entrance and exit ramps instead of driving long distances in a straight line.

Some regions may not have limited-access highways. Should that be the case, use a highway with a speed limit as close as possible to 90 km/h and practice entering and exiting commercial lots, where authorized.

Parking
(Mid-Trip Inspection)

Exercise 8.11

- **Competency component:** 8.3
- **Time required:** 5 minutes
- **Frequency:** After each exercise

Overview

Summary

After parking the semi-trailer truck, you will carry out the equivalent of a mid-trip inspection and make sure all cab accessories are turned off before leaving the vehicle.

Learning Objectives

Knowledge and abilities:

- Park a semi-trailer truck properly.
- Carry out several verifications.
- Turn off all cab accessories.

Soft skills:

- Understand that positioning a heavy vehicle in the middle of a parking space ensures that other road users are able to use the adjacent spaces.
- Before parking a semi-trailer truck in a particular area, be sure you are authorized to do so.

Exercise

Learning Environment

Where:

- Safe practice area

What you will need:

- Semi-trailer truck
- Electronic logging device

Preparation

Tasks to complete beforehand:

- Review the notions on parking a semi-trailer truck (Chapter 4).

Appendix

- Roll up the windows.
- Walk around the semi-trailer truck to check the lights and tires, ensure the cargo is properly secured, etc.
- Climb back in the road tractor and turn off all systems and cab accessories, and then ensure all openings in the vehicle combination are properly locked.

Rural Driving

Exercise 8.12

- **Competency component:** 8.2
- **Time required:** 2 hours
- **Frequency:** Twice

Overview

Summary

- You will drive a loaded semi-trailer truck in a rural setting.

Learning Objectives

Knowledge and abilities:

- Develop the ability to keep the vehicle in your lane.
- Get into the habit of scanning your surroundings as far ahead as possible and checking your side mirrors.
- Maintain a good hand position on the steering wheel.
- Identify situations where you may need to use the differential lock and follow the steps to activate it.
- Shift into the right gear when going up and down steep or long slopes.

Depending on the type of transmission:

- Upshift and downshift.

Soft skills:

- Respect other road users by not encroaching on the centre line.
- Pay attention to your driving.

Exercise

Learning Environment

Where:

- Roads with a speed limit between 70 km/h and 90 km/h
- Route through the countryside that takes narrow, winding roads and highways and goes up and down slopes
- Access to a safe space where you can stop the vehicle and speak with your instructor

What you will need:

- Loaded semi-trailer truck
- Electronic logging device

Preparation

Tasks to complete beforehand:

- Review the laws and regulations that apply to driving a heavy vehicle (Chapter 3).
- Review the notions on basic driving manoeuvres (Chapter 4).
- Review all the basic driving manoeuvres you have practiced so far (Chapter 7).
- Review what you have learned about driving on the road network and ELDs (Exercises 8.1, 8.4 and 8.10).

Appendix

If you are using a manual transmission, your instructor may show you how to skip gears when upshifting or downshifting, depending on how steep the slope is.

Information and Itinerary

A bill of lading provides the address of both the shipper and the consignee, and it also describes the cargo. This document is useful in planning your itinerary, especially if the cargo contains dangerous substances or exceeds load and size limits. Planning your route in advance reduces the risk of running into unexpected situations, gives you an idea of where you will need to turn off or change roads, and also helps you save time and fuel.

You can prepare your itinerary using paper maps, a GPS, mapping software, a smart phone mapping application, or any combination of these tools. Assistance or directions provided by a colleague can also help you prepare an ideal and efficient itinerary. Good planning covers the roads or highways you should take, any detours required if you are carrying dangerous substances, solutions for getting around roadwork or other obstacles, rest and meal breaks, etc. Planning also helps you figure out the distance between rest stops, how long it will take to get to your destination, the estimated time of arrival, the layout of the place where you will be delivering your load, and so on.

The following exercise can be done using a bill of lading prepared by your instructor.

Driving to a Specific Destination

Exercise 8.13

- **Competency component:** 8.2
- **Time required:** 2 hours
- **Frequency:** Twice (you will be assessed the second time)

Overview

Summary

You will drive a loaded semi-trailer truck to a specific destination. You must use a GPS or road map to plan your route. You must back up once during your trip.

Learning Objectives

Knowledge and abilities:

- Drive a semi-trailer truck on various types of roads.
- Make sure you are familiar with the details of your itinerary.
- Assess on your own the space required and available before positioning the vehicle appropriately and backing up.

Soft skills:

- Become more independent at the wheel of a semi-trailer truck.
- Get into the habit of setting your GPS before leaving and not while driving.
- Take eco-driving principles into consideration.

Exercise

Learning Environment

Where:

- Route that takes winding, rural highways and roads
- Safe place where you are authorized to back up
- Access to a safe space where you can stop the vehicle and speak with your instructor

What you will need:

- Loaded semi-trailer truck
- Bill of lading (see the appendix)
- Electronic logging device
- Road maps or GPS
- Protective gear

Preparation

Tasks to complete beforehand:

- Review the laws and regulations that apply to driving a heavy vehicle (Chapter 3).
- Review the notions on basic driving manoeuvres (Chapter 4).
- Review all the basic driving manoeuvres you have practiced so far (Chapter 7).
- Review what you have learned about driving on the road network (Exercises 8.4, 8.10 and 8.12).

Appendix

Obtain authorization before backing up and avoid touching the loading dock or the loading dock pads to avoid causing any damage.

Bill of lading

Transport CO

700, rue de l'Avenir, St-Clet (Québec) G1N 2G3
Telephone: 450 555-5580 Fax: 450 555-0290

Date:

Bill of Lading

Bill of Lading No.

RIN: 004106-2		
Shipper:		
Address:	Municipality:	
Province: QC	Postal code:	Telephone:
Resource person:		
Consignee:		
Address:	Municipality:	
Province: QC	Postal code:	
Resource person:		
Point of origin:		
Special instructions:		

Quantity and type of packaging	Description of goods and any special care required	Weight ☐ lb ☐ kg	Rate	Amount

Transportation schedule			
Date picked up:		Instructor:	
Date delivered:		Instructor:	

Shipper	**Carrier**	**Consignee**
Date:	Date:	Date:
Signing	Signing	Signing

Driving Longer Routes

Exercise 8.14

- **Competency component:** 8.2
- **Time required:** 4 hours
- **Frequency:** Once

Overview

Summary

You will drive a longer route with a loaded semi-trailer truck.

Learning Objectives

Knowledge and abilities:

- Drive a loaded semi-trailer truck for several hours on various types of highways and roads.
- Adapt your driving to road and weather conditions.
- Inspect the cargo periodically to ensure it remains properly secured.
- Keep an eye on the dashboard indicators (air pressure, fuel level, exhaust fluid, etc.).
- Refuel as required.
- Stop at a weigh station or brake inspection station if possible.

Soft skills:

- Note your level of endurance and pay attention to signs of fatigue. Take a break if required.
- Adopt a relaxed attitude toward things over which you have no control while driving (traffic, roadwork, weather, etc.).
- Be aware and mindful of how you behave toward other road users.

Exercise

Learning Environment

Where:

- Route that includes rural highways and roads, limited-access highways and city streets
- Highway with a weigh station or brake inspection station, if possible
- Access to a safe place to park the vehicle

What you will need:

- Loaded semi-trailer truck
- Electronic logging device

Preparation

Tasks to complete beforehand:

- Review the laws and regulations that apply to driving a heavy vehicle (Chapter 3).
- Review the notions on basic driving manoeuvres (Chapter 4).
- Review all the basic driving manoeuvres you have practiced so far (Chapter 7).
- Review everything you have learned so far about driving on the road network (Chapter 8).

Appendix

It can take a while to develop the same level of endurance as experienced heavy vehicle drivers. **Acknowledge and respect your limits** and know when you need to take a break.

Exercise Log

Exercise	Exercise Number	Time Required	Frequency						Total Time Allocated	Actual Number of Hours
			1	2	3	4	5	6		
Using an electronic logging device	8.1	15 min	◉	▲	▲	▲	▲	▲	0.25	
Doing a circle check of a semi-trailer truck	8.2	20 min	▲	▲	▲	▲	▲	▲		
Backing up a semi-trailer at a 45-degree angle from the left	8.3	5 min	▲	▲	▲	▲	▲	▲		
Learning to drive on the road	8.4	1 h	◉	◉	◉				3	
Being vigilant when driving in cities	8.5	1 h	◉	◉	◉				3	
Normal city driving	8.6	2 h	◉	◉					4	
Complex city driving	8.7	1 h	◉						1	
Merging lanes in cities	8.8	1 h	◉						1	
Backing up a semi-trailer at a 90-degree angle from the left	8.9	1 h	◉						1	
Driving on limited-access highways*	8.10	1 h 30	◉	◉	◉				4.5	
Parking (mid-trip inspection)	8.11	5 min	◉	▲	▲	▲	▲	▲	0.083	
Rural driving	8.12	2 h	◉	◉	◉				6	
Driving to a specific destination	8.13	2 h	◉	◉					4	
Driving longer routes	8.14	4 h	◉						4	
Summative assessment included in Exercise 8.13										
Total									**81.833**	

◉ Mandatory exercise

▲ Exercise repeated throughout the in-vehicle training

* Some regions may not have limited-access highways. Should that be the case, use a highway with a speed limit as close as possible to 90 km/h and practice entering and exiting commercial lots, where authorized.

Competency 8 Self-Evaluation No. 1

Driving on the Road Network

Student name: _____ **Date:** _____

Legend
1: No mastery **2:** Poor mastery **3:** Good mastery **4:** Confident mastery

Competency Statement Operate a semi-trailer truck on the road network safely and independently		**Student** Self-Evaluation			
Competency Component	**Performance Criteria**	**1**	**2**	**3**	**4**
Operate a semi-trailer truck in cities and on highways.	**Driving techniques applied appropriately based on the driving situation (flat or hilly terrain, intersections, turns and lane changes)**				
	› Proper anticipation of and preparation for turns	○	○	○	○
	› Turns made using the available space	○	○	○	○
	› Good coordination of the gear selector, clutch and accelerator	○	○	○	○
	› Proper use of the service brake	○	○	○	○
	› Compliance with the *Highway Safety Code*	○	○	○	○
	› Proper handling without encroaching on other lanes, especially in curves	○	○	○	○
	Backing up techniques properly applied				
	› Backing up properly from the left and the right	○	○	○	○
	› Proper handling of the steering wheel while backing up	○	○	○	○
	› Turn-signal lights used appropriately	○	○	○	○
	› Appropriate technique based on the available space	○	○	○	○
	› Proper use of side mirrors	○	○	○	○
	› Getting out to check around the vehicle	○	○	○	○
	› Proper use of reference points	○	○	○	○
	› Good management of the accelerator when backing up	○	○	○	○
	› Positioning the trailer so it is straight and centred at the loading dock	○	○	○	○

Legend
1: No mastery **2:** Poor mastery **3:** Good mastery **4:** Confident mastery

Competency Statement Operate a semi-trailer truck on the road network safely and independently		**Student** Self-Evaluation			
Competency Component	**Performance Criteria**	**1**	**2**	**3**	**4**
Operate a semi-trailer truck in cities and on highways.	**Surroundings scanned frequently, intentions signaled appropriately and traffic laws strictly observed**				
	› Frequent use of side mirrors on straight roads and in curves	○	○	○	○
	› Looking to the left and right at level crossings and intersections	○	○	○	○
	› Appropriate use of turn-signal lights when turning or changing lanes	○	○	○	○
	› Full stop at intersections with a stop sign	○	○	○	○
	› No swaying of the trailer over a 50-metre stretch	○	○	○	○
Assess and regulate behaviour in order to be a safe, cooperative and responsible driver	**Self-reflection carried out with regard to behaviour as a semi-trailer truck driver**				
	› Safe distance kept from any vehicles ahead	○	○	○	○
	› Courtesy shown to other road users merging into the same lane	○	○	○	○
	› Complying with the obligation to yield to oncoming vehicles when merging into traffic	○	○	○	○
	› Defensive driving techniques used to adjust to slowing traffic	○	○	○	○
	› Good stress management during traffic congestion	○	○	○	○
	› No verbal abuse or aggressive behaviour toward other road users	○	○	○	○

Competency 8
Self-Evaluation No. 2
Driving on the Road Network

Student name:

Date:

Legend
1: No mastery **2:** Poor mastery **3:** Good mastery **4:** Confident mastery

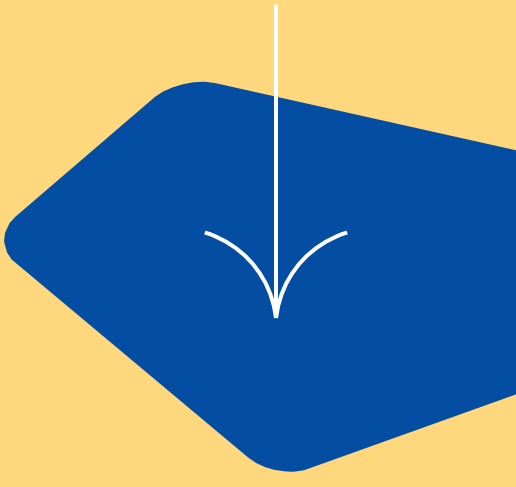
Competency Statement Operate a semi-trailer truck on the road network safely and independently		**Student** Self-Evaluation			
Competency Component	**Performance Criteria**	**1**	**2**	**3**	**4**
Operate a semi-trailer truck in cities and on highways.	**Driving techniques applied appropriately based on the driving situation (flat or hilly terrain, intersections, turns and lane changes)**				
	› Proper anticipation of and preparation for turns	○	○	○	○
	› Turns made using the available space	○	○	○	○
	› Good coordination of the gear selector, clutch and accelerator	○	○	○	○
	› Proper use of the service brake	○	○	○	○
	› Compliance with the *Highway Safety Code*	○	○	○	○
	› Proper handling without encroaching on other lanes, especially in curves	○	○	○	○
	Backing up techniques properly applied				
	› Backing up properly from the left and the right	○	○	○	○
	› Proper handling of the steering wheel while backing up	○	○	○	○
	› Turn-signal lights used appropriately	○	○	○	○
	› Appropriate technique based on the available space	○	○	○	○
	› Proper use of side mirrors	○	○	○	○
	› Getting out to check around the vehicle	○	○	○	○
	› Proper use of reference points	○	○	○	○
	› Good management of the accelerator when backing up	○	○	○	○
	› Positioning the trailer so it is straight and centred at the loading dock	○	○	○	○

Legend
1: No mastery **2:** Poor mastery **3:** Good mastery **4:** Confident mastery

Competency Statement Operate a semi-trailer truck on the road network safely and independently		**Student** Self-Evaluation			
Competency Component	**Performance Criteria**	**1**	**2**	**3**	**4**
Operate a semi-trailer truck in cities and on highways.	**Surroundings scanned frequently, intentions signaled appropriately and traffic laws strictly observed**				
	› Frequent use of side mirrors on straight roads and in curves	○	○	○	○
	› Looking to the left and right at level crossings and intersections	○	○	○	○
	› Appropriate use of turn-signal lights when turning or changing lanes	○	○	○	○
	› Full stop at intersections with a stop sign	○	○	○	○
	› No swaying of the trailer over a 50-metre stretch	○	○	○	○
Assess and regulate behaviour in order to be a safe, cooperative and responsible driver	**Self-reflection carried out with regard to behaviour as a semi-trailer truck driver**				
	› Safe distance kept from any vehicles ahead	○	○	○	○
	› Courtesy shown to other road users merging into the same lane	○	○	○	○
	› Complying with the obligation to yield to oncoming vehicles when merging into traffic	○	○	○	○
	› Defensive driving techniques used to adjust to slowing traffic	○	○	○	○
	› Good stress management during traffic congestion	○	○	○	○
	› No verbal abuse or aggressive behaviour toward other road users	○	○	○	○

A

Exercise Answer Key



Chapter 1

Exercise 1.1

Variable answers.

Exercise 1.2

Variable answers.

Exercise 1.3

Good physical condition	9
Technological skills	2
Computer skills	6
Bilingualism/Functional English skills	7
Independence	8
Good communication skills	5
Speed of execution/Efficiency	3
Being a safe driver/Having a good driving record	1
Calm/Resistance to stress	4
Thoroughness	10

Exercise 1.4

Variable answers.

Exercise 1.5

Variable answers. Active participation.

Chapter 2

Exercise 2.1

The instructor will make sure you have located the components and filled out the table.

Exercise 2.2

1. True
2. False
3. True
4. True
5. False

Exercise 2.3

The instructor will make sure you have located the components and filled out the table.

Exercise 2.4

1. False
2. False
3. True
4. True
5. True

Exercise 2.5

Source: Macpek

Pyrometer (exhaust gas temperature indicator)

Tachometer (rev counter)

Information centre

Odometer

Speedometer

Engine oil pressure gauge

Voltmeter

Air pressure gauges for the primary and secondary reservoirs

Diesel fuel and exhaust fluid levels

Low air pressure indicator

Coolant temperature gauge

Exercise 2.6

The instructor will make sure you have located the components and filled out the table.

Chapter 3

Exercise 3.1

Exercise 3.1.1

1. C
2. B
3. D
4. A

Exercise 3.1.2

Answer: E

Exercise 3.1.3

1.	B	This road sign uses an arrow to show the route that trucks in transit must take.
2.	B	This road sign placed above a lane means that carriers transporting dangerous substances requiring the display of safety marks are not authorized to use that lane.
3.	B	This road sign placed above a lane means that trucks must use that lane.
4.	A	This road sign serves to indicate the route that carriers must take if they are transporting dangerous substances requiring the display of safety marks.
5.	B	This road sign means that anyone driving a vehicle or vehicle combination with a total loaded mass of 3,000 kg or more must check their brakes by coming to a full stop at the stop sign found in the brake check area.
6.	A	This sign indicates that slow-moving traffic must use the right lane. Although the sign uses the image of a truck, it applies to all slow-moving vehicles.

Exercise 3.1.4

1. B	This road sign indicates that access is prohibited to trucks whose number of axles exceeds the specified limit. An exception is allowed in the case of trucks making local deliveries.
2. D	This road sign indicates that access is prohibited to trucks whose width exceeds the specified limit.
3. A	This road sign indicates that access is prohibited to trucks whose length exceeds the specified limit (more than 25 m).
4. B	This weight restriction road sign appears near certain bridges and overpasses. Trucks, buses, tool vehicles and equipment transport vehicles with a total loaded mass that exceeds the mass indicated on the sign are not authorized to use the bridge or overpass in question. An exception is made in the case of outsized vehicles for which a special travel permit has been obtained authorizing it to be driven on public roads.
5. B	This weight restriction road sign appears near certain bridges and overpasses. Trucks, tool vehicles and equipment transport vehicles whose mass exceeds the load limits prescribed under the *Vehicle Load and Size Limits Regulation* are not authorized to use the bridge or overpass in question, unless a special travel permit has been issued under section 463 or 633 of the *Highway Safety Code* expressly authorizing them to do so.
6. B	This road sign indicates that access is prohibited to trucks. An exception is allowed in the case of trucks making local deliveries.
7. A	Yes
8. B	No
9. A	Yes
10. B	This road sign uses an arrow to indicate a lane that trucks are not authorized to use.
11. B	This road sign uses an arrow to indicate a lane that trucks are not authorized to use.
12. B	This road sign placed above a lane means that carriers transporting dangerous substances requiring the display of safety marks are not authorized to use that lane.
13. A	This road sign above a lane means that trucks are no longer prohibited from using that lane.
14. B	This road sign means that the exit ramp leads to a road that trucks, equipment transport vehicles and tool vehicles are not authorized to use, except to make local deliveries.
15. A	This road sign means that trucks are not authorized to use this public road at certain times, except to make local deliveries.

Exercise 3.1.5

1. C
2. D
3. B
4. A

Exercise 3.2

Answer to be validated by the instructor.

Exercise 3.3

1. True
2. True
3. False
4. True
5. True

Exercise 3.4

1. **Answer:** No
   18,500 kg ÷ 2 = 9,250 kg ÷ 2,248 kg = 4.11 = 5 tiedowns
2. **Answer:** No
   15 m ÷ 3.04 m = 4.93 = 5 tiedowns, load immobilized
3. **Answer:** Yes
   Mass: 12,000 kg ÷ 2 = 6,000 kg ÷ 2,248 kg = 2.67 = 3 tiedowns
   Length: 9 m ÷ 3.04 m = 2.96 = 3 tiedowns + 1 tiedown because the load is not immobilized = 4 tiedowns
4. **Answer:** No
   Mass: 23,000 kg ÷ 2 = 11,500 kg ÷ 2,248 kg = 5.11 = 6 tiedowns
   Length: 11.32 m ÷ 3.04 m = 3.72 = 4 tiedowns + 1 tiedown because the load is not immobilized = 5 tiedowns
5. **Answer:** Yes
   Segment 1: Mass: 8,500 kg ÷ 2 = 4,250 kg ÷ 2,248 kg = 1.89 = 2 tiedowns
   Length: 1.52 m ÷ 3.04 m = 0.5 = 1 tiedown
   Total: 2 tiedowns

   Segment 2: Mass: 20,000 kg ÷ 2 = 10,000 kg ÷ 2,248 kg = 4.44 = 5 tiedowns
   Length: 9 m ÷ 3.04 m = 2.96 = 3 tiedowns + 1 tiedown because the load is not immobilized = 4 tiedowns
   Total: 4 tiedowns

Exercise 3.5

1. **Answer:** 4 tiedowns
   Mass: 15,500 kg ÷ 2 = 7,750 kg ÷ 2,500 kg = 3.1 = 4 tiedowns
   Length: 8.65 m ÷ 3.04 m = 2.85 = 3 tiedowns + 1 tiedown because the load is not immobilized = 4 tiedowns
2. **Answer:** 3 tiedowns
   Segment 1: Length: 3 m ÷ 3.04 m = 0.98 = 1 tiedown + 1 tiedown because the load is not immobilized = 2 tiedowns
   Segment 2: Length: 2 m ÷ 3.04 m = 0.65 = 1 tiedown, load immobilized = 1 tiedown
3. **Answer:** 3 tiedowns
   Mass: 12,000 ÷ 2 = 6,000 kg ÷ 2,500 kg = 2.4 = 3 tiedowns
   Length: 6.8 m ÷ 3.04 m = 2.24 = 3 tiedowns, load immobilized = 3 tiedowns
4. **Answer:** 5 tiedowns
   Mass: 22,000 ÷ 2 = 11,000 ÷ 2,500 kg = 4.4 = 5 tiedowns
   Length: 5.09 m ÷ 3.04 m = 1.67 = 2 tiedowns + 1 tiedown because the load is not immobilized = 3 tiedowns
5. **Answer:** 2 tiedowns
   Segment 1: Mass: 400 kg ÷ 2,500 kg = 0.16 = 1 tiedown
   Length: 1.52 m ÷ 3.04 m = 0.5 = 1 tiedown, load immobilized = 1 tiedown
   Total: 1 tiedown

   Segment 2: Mass: 400 kg ÷ 2 500 kg = 0.16 = 1 tiedown
   Length: 1.52 m ÷ 3.04 m = 0.5 = 1 tiedown (see section 22, NSC 10)
   Total: 1 tiedown

Exercise 3.6

Answer to be validated by the instructor.

Exercise 3.7

1. False
2. False
3. True
4. False
5. True
6. False
7. True
8. False
9. False
10. True

Exercise 3.8

1. False
2. True
3. True
4. True
5. False
6. False

Exercise 3.9

1. F
2. E
3. A
4. B
5. C
6. D

Exercise 3.10

1. F
2. B
3. E
4. A
5. C
6. D

Exercise 3.11

1. D
2. C
3. A
4. A
5. A

Exercise 3.12

1. True
2. True
3. False
4. True
5. True

Exercise 3.13

1. True
2. True
3. True
4. False
5. False
6. True
7. True
8. False

Exercise 3.14

1. 13 hours
2. 14 hours
3. 8 hours
4. 10 hours
5. 24 hours
6. No
7. Yes
8. No
9. 16 hours
10. 120 hours

Exercise 3.15

1. 12 hours
2. 1 hour
3. 9 hours

4.

Off-duty requirement	Met
At least 10 hours of off-duty time (daily requirement)	✕
At least eight consecutive hours of off-duty time before each work shift	✕
At least two hours of off-duty time not included in the eight consecutive hours required before each work shift (may be divided into breaks of no less than 30 minutes)	✕

Work shift requirement	Met
No more than 13 hours of driving time	✕
No more than 14 hours of on-duty time	✕
No more than 16 hours between the start and end of the work shift	✕

(✕) Compliant

( ) Non-compliant

5.

Off-duty requirement	Met
At least 10 hours of off-duty time (daily requirement)	
At least eight consecutive hours of off-duty time before each work shift	✕
At least two hours of off-duty time not included in the eight consecutive hours required before each work shift (may be divided into breaks of no less than 30 minutes)	

Work shift requirement	Met
No more than 13 hours of driving time	✕
No more than 14 hours of on-duty time	✕
No more than 16 hours between the start and end of the work shift	✕

( ) Compliant

(✕) Non-compliant

6.

Off-duty requirement	Met
At least 10 hours of off-duty time (daily requirement)	
At least eight consecutive hours of off-duty time before each work shift	✕
At least two hours of off-duty time not included in the eight consecutive hours required before each work shift (may be divided into breaks of no less than 30 minutes)	✕

Work shift requirement	Met
No more than 13 hours of driving time	✕
No more than 14 hours of on-duty time	
No more than 16 hours between the start and end of the work shift	

( ) Compliant

(✕) Non-compliant

7.

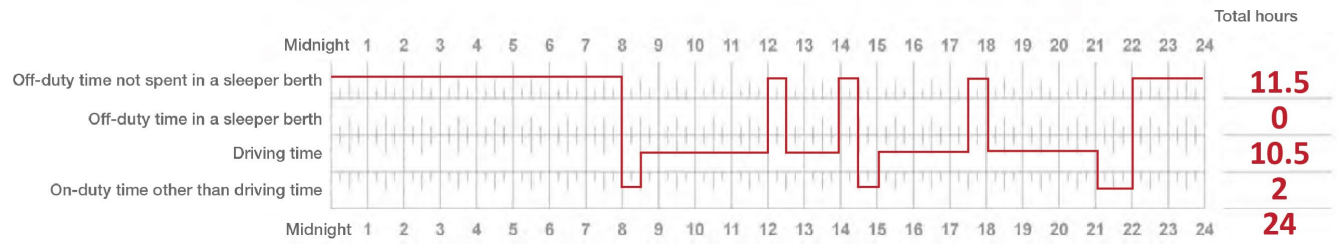
Off-duty requirement	Met
At least 10 hours of off-duty time (daily requirement)	✕
At least eight consecutive hours of off-duty time before each work shift	✕
At least two hours of off-duty time not included in the eight consecutive hours required before each work shift (may be divided into breaks of no less than 30 minutes)	✕

Work shift requirement	Met
No more than 13 hours of driving time	✕
No more than 14 hours of on-duty time	✕
No more than 16 hours between the start and end of the work shift	✕

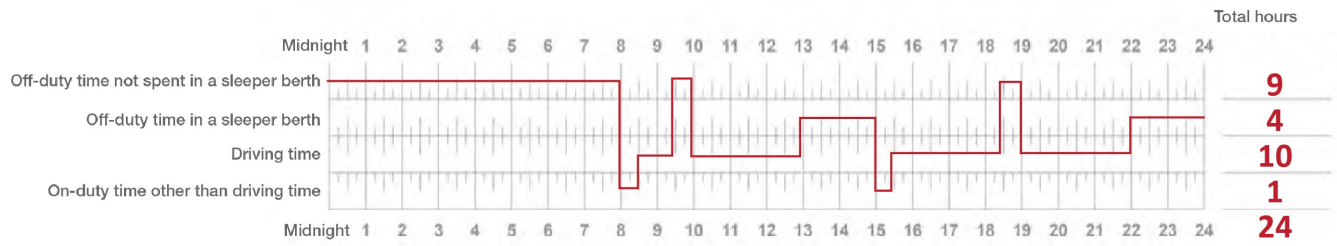
(✕) Compliant

( ) Non-compliant

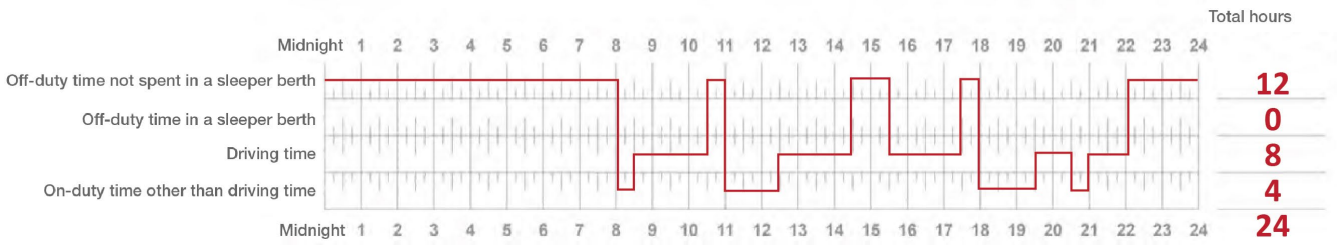
8.



9.



10.



Chapter 4

Exercise 4.1

1. True
2. False
3. True
4. False
5. False

Exercise 4.2

1. False
2. True
3. False
4. True
5. False
6. True

Exercise 4.3

1. True
2. True
3. False
4. False
5. False

Exercise 4.4

1. False
2. False
3. True
4. False
5. True

Exercise 4.5

1. C
2. A
3. A
4. C
5. C
6. A
7. A
8. A
9. A
10. C

Exercise 4.6

1. True
2. False
3. False
4. True
5. True

Exercise 4.7

1. B
2. B
3. D
4. B
5. C
6. B
7. D
8. A
9. B
10. D

Chapter 5

Exercise 5.1

The instructor will check the diagram.

Exercise 5.2

The instructor will check the components and their location.

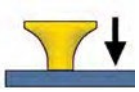
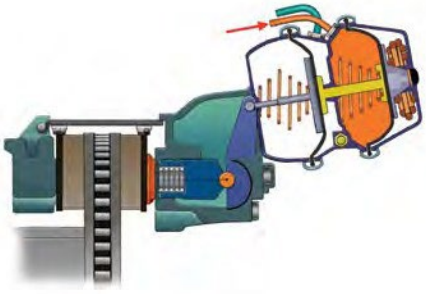
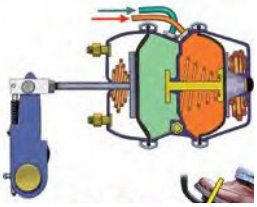
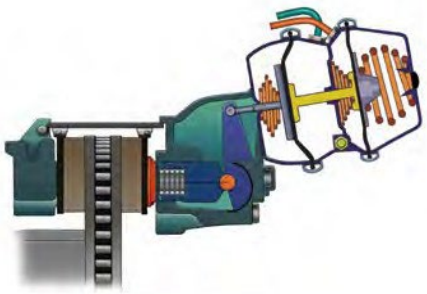
Exercise 5.3

The instructor will check the diagram.

Exercise 5.4

The instructor will check the components, their role and the units of measurement.

Exercise 5.5

Brake chamber	Position of the parking brake control knob		Movement of the service brake pedal	
				
	X		X	
	X			X
		X	X	

Exercise 5.6

1. False
2. False
3. False
4. False
5. True

Chapter 6

Exercise 6.1

1. False
2. False
3. True
4. True
5. True

Exercise 6.2

1. False
2. True
3. True
4. False
5. False

Exercise 6.3

The instructor will evaluate the circle check performed on a heavy vehicle.

Exercise 6.4

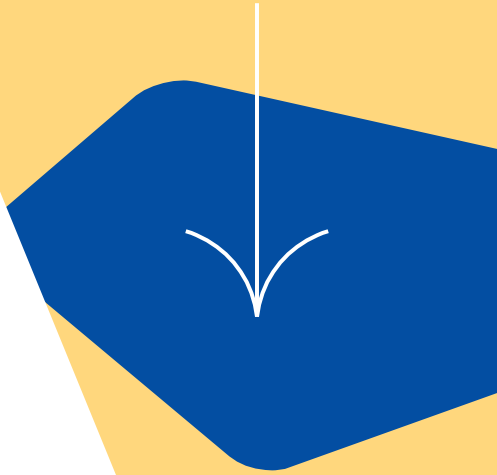
1. False
2. True
3. True
4. True
5. A
6. B
7. B
8. B
9. B
10. True
11. False
12. D
13. A
14. C
15. C
16. C
17. B
18. C
19. B
20. A

Exercise 6.5

1. A
2. C
3. A
4. C
5. A
6. C
7. B
8. A
9. A
10. C
11. A
12. C
13. A
14. A
15. A

A

Appendices



Appendix 1 – Road Signs, Traffic Signals and Pavement Markings

This road sign provides advance warning of a curve designed in such a way that heavy vehicles with a high centre of gravity have a high risk of rolling over.

This road sign provides advance warning of a level crossing that is designed in such a way that heavy vehicle drivers must slow down to less than 70% of the posted speed limit in order to cross safely.

This road sign means that loaded trucks may pull onto the public roadway from an access road ahead.

This road sign provides advance warning of a truck crossing where the stopping sight distance is insufficient.

This road sign indicates a parking area reserved for trucks.

This tab is placed below a road sign and means that the road sign does not apply to trucks.

This road sign uses an arrow to show the route that trucks in transit must take.

This road sign placed above a lane means that trucks must use that lane.

This road sign serves to indicate the route that carriers must take if they are transporting dangerous substances requiring the display of safety marks.

This road sign placed above a lane means that carriers must use that lane if they are transporting dangerous substances requiring the display of safety marks.

This road sign indicates that access is prohibited to trucks.

This road sign indicates that access is prohibited to trucks with a total loaded mass that exceeds the specified limit. An exception is allowed in the case of trucks making local deliveries.

This road sign indicates that access is prohibited to trucks whose length exceeds the specified limit.

This road sign indicates that access is prohibited to trucks whose width exceeds the specified limit.

This road sign indicates that access is prohibited to trucks whose number of axles exceeds the specified limit. An exception is allowed in the case of trucks making local deliveries.

This road sign uses an arrow to indicate a lane that trucks are not authorized to use.

This road sign indicates that access is prohibited to trucks. An exception is allowed in the case of trucks making local deliveries.

This road sign reminds truck drivers making local deliveries that they are on a road that trucks are normally prohibited from using, except to make local deliveries.

This road sign above a lane means that trucks are no longer prohibited from using that lane.

This road sign placed above a lane means that carriers transporting dangerous substances requiring the display of safety marks are not authorized to use that lane.

This road sign uses an arrow to indicate a lane that trucks are not authorized to use.

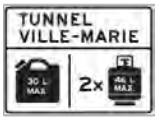
This road sign means that the exit ramp leads to a road that trucks, equipment transport vehicles and tool vehicles are not authorized to use, except to make local deliveries.

This road sign means that trucks are not authorized to use this public road at certain times, except to make local deliveries.

This road sign means that drivers of heavy vehicles equipped with a speed limiter must activate the device and set it at a speed that is not greater than the maximum speed shown on the sign.

This road sign appears in brake check areas and provides information on what needs to be checked.

This road sign reminds road users of the maximum quantities of certain dangerous substances that can be transported in a tunnel.



This tab is placed under a road sign prohibiting access to indicate that local deliveries are allowed.

This VÉRIFICATION road sign means that anyone driving a vehicle or vehicle combination with a total loaded mass of 3,000 kg or more must check their brakes by coming to a full stop at the stop sign found in the brake check area.

This weight restriction road sign appears near certain bridges and overpasses. Trucks, buses, tool vehicles and equipment transport vehicles with a total loaded mass that exceeds the mass indicated on the sign are not authorized to use the bridge or overpass in question. An exception is made in the case of outsized vehicles for which a special travel permit has been obtained authorizing it to be driven on public roads.

This weight restriction road sign appears near certain bridges and overpasses. Trucks, tool vehicles and equipment transport vehicles whose mass exceeds the load limits prescribed under the Vehicle Load and Size Limits Regulation are not authorized to use the bridge or overpass in question, unless a special travel permit has been issued under section 463 or 633 of the Highway Safety Code expressly authorizing them to do so.

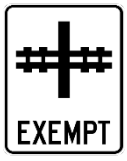
This road sign warns of a traffic lane reserved for buses merging ahead.

This road sign indicates the presence of a parking area specially designed for people using public transit.

This pavement marking is used in urban areas to mark bus stop zones.

This road sign warns of a school bus stop ahead, where drivers may come across a bus that has stopped to take on or let off schoolchildren.

An EXEMPT road sign at a level crossing means that buses, minibuses and road vehicles carrying certain types of dangerous substances prescribed by regulation are not required to stop before crossing the level crossing in question.



This traffic signal (a white horizontal bar) means that all priority manoeuvres for buses are prohibited.

This traffic signal (a white vertical bar) means that buses are only authorized to go straight. Left and right turns are prohibited.

This traffic signal (a white triangle) means that buses are granted extra time to exit an intersection (called a “clearance interval”). This signal serves the same function as the yellow (amber) light for regular traffic.

This traffic signal (a white bar slanted to the right) means that buses are only authorized to turn right.

This traffic signal (a white bar slanted to the left) means that buses are only authorized to turn left.

This traffic signal (the word BUS) means that buses are authorized to perform manoeuvres in all directions.

This tab placed beneath a road sign means that the road sign does not apply to buses.

This tab placed beneath a road sign means that the road sign does not apply to public transit buses.

This road sign indicates a parking area reserved for buses.

This road sign means that access is prohibited to public transit buses.

This road sign indicates a route or lane that buses must use.

This tab placed beneath a road sign means that the road sign does not apply to buses or minibuses.

This road sign means that access is prohibited to trucks and motor coaches.

This road sign means that access is prohibited to school buses.

This road sign means that access is prohibited to buses and minibuses. The word BUS covers both buses and minibuses.

This road sign is placed at the beginning of sections of limited-access highways and other limited-access roads where buses and minibuses are authorized to drive on the shoulder.

This road sign means that an extra lane for slow-moving traffic begins in 100 m. Lanes for slow-moving traffic are used in places where a slope may be too steep or long for certain vehicles to be able to maintain their speed. Road signs are used to announce the beginning and end of such lanes.

Appendix 2 - Circle Check

Sheet 1

NAME

CIRCLE CHECK

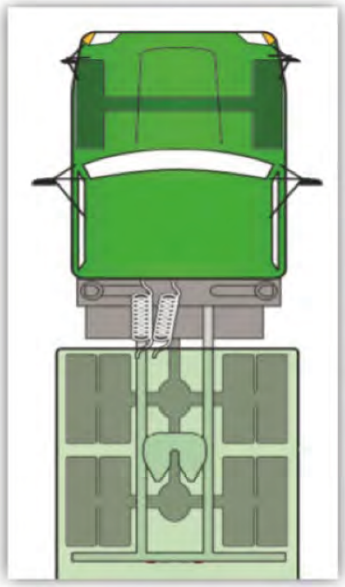
TRACTOR EXTERIOR

DATE

SAG	
WHEEL PARALLELISM (TOE)	
BODY	
FLUID LEAK	
LOW BEAMS	
PARKING LIGHTS	
TURN-SIGNAL LIGHTS	

POWER STEERING FLUID	
STEERING	
SUSPENSION	
TIRE	
VALVE	
WHEEL	
HUB	

STEERING	
SUSPENSION	
TIRE	
VALVE	
WHEEL	
HUB	



SIDE MIRRORS	
DOOR	
FUEL TANK	
FUEL TANK FILLER CAP	
FUEL LEAK	
SIDE RAIL	
BODY	

SIDE MIRRORS	
DOOR	
FUEL TANK	
FUEL TANK FILLER CAP	
FUEL LEAK	
SIDE RAIL	
BODY	

FIFTH WHEEL	
Bolts	
Locking pins	
Coupling plate	
CROSS MEMBERS	
SUSPENSION	
TIRES	
VALVES	
WHEELS	
HUBS	

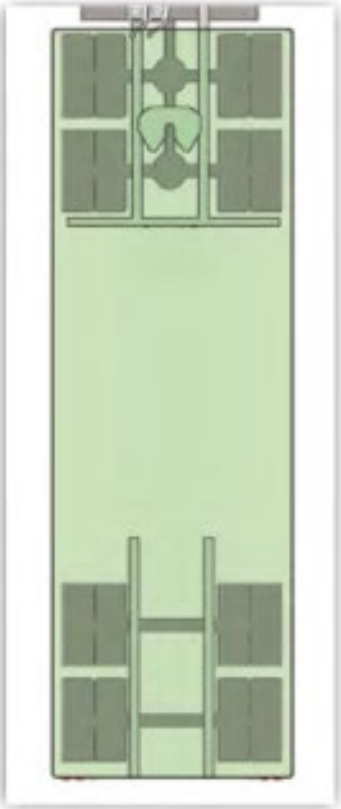
FIFTH WHEEL	
Bolts	
Locking pins	
Coupling plate	
CROSS MEMBERS	
SUSPENSION	
TIRES	
VALVES	
WHEELS	
HUBS	

JAWS	
PARKING LIGHTS	
TURN-SIGNAL LIGHTS	
BRAKE LIGHTS	
BODY	

SEMI-TRAILER EXTERIOR

KING PIN	
FIFTH WHEEL	
JAWS	
CROSS MEMBERS	

SIDE RAIL	
BODY	



SIDE RAIL	
BODY	

LOCKING PINS	
SUSPENSION	
TIRES	
WHEELS	
VALVES	
HUBS	
WHEEL PARALLELISM (TOE)	

LOCKING PINS	
SUSPENSION	
TIRES	
WHEELS	
VALVES	
HUBS	
WHEEL PARALLELISM (TOE)	

PARKING LIGHTS	
TURN-SIGNAL LIGHTS	
BRAKE LIGHTS	
LICENCE PLATE LIGHT	
COUPLING DEVICE	

TRACTOR INTERIOR

MIRRORS	
WINDSHIELD	
SIDE WINDOWS	
WINDSHIELD WIPERS	
WINDSHIELD WASHER FLUID	
BLOWER	
STEERING WHEEL	
STEERING COLUMN	
HORN	
SEAT	
SEAT BELT	
EMERCENCY MATERIAL	

AIR TESTS (service brake)	
LOW AIR PRESSURE INDICATOR	
PERFORMANCE	
STOP	
AIRTIGHTNESS	
COMPRESSOR SWITCHES ON	

EXHAUST ODOURS	
ACCELERATOR PEDAL	

PARKING BRAKE	
Tractor	
Semi-trailer	
POWER STEERING	
CLUTCH	
SERVICE BRAKE	

Sheet 2

NAME

CIRCLE CHECK

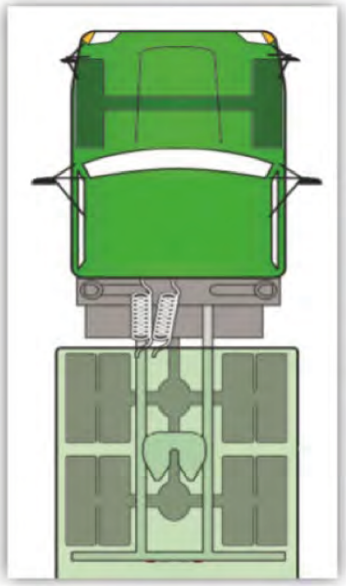
TRACTOR EXTERIOR

DATE

SAG	
WHEEL PARALLELISM (TOE)	
BODY	
FLUID LEAK	
LOW BEAMS	
PARKING LIGHTS	
TURN-SIGNAL LIGHTS	

POWER STEERING FLUID	
STEERING	
SUSPENSION	
TIRE	
VALVE	
WHEEL	
HUB	

STEERING	
SUSPENSION	
TIRE	
VALVE	
WHEEL	
HUB	



SIDE MIRRORS	
DOOR	
FUEL TANK	
FUEL TANK FILLER CAP	
FUEL LEAK	
SIDE RAIL	
BODY	

SIDE MIRRORS	
DOOR	
FUEL TANK	
FUEL TANK FILLER CAP	
FUEL LEAK	
SIDE RAIL	
BODY	

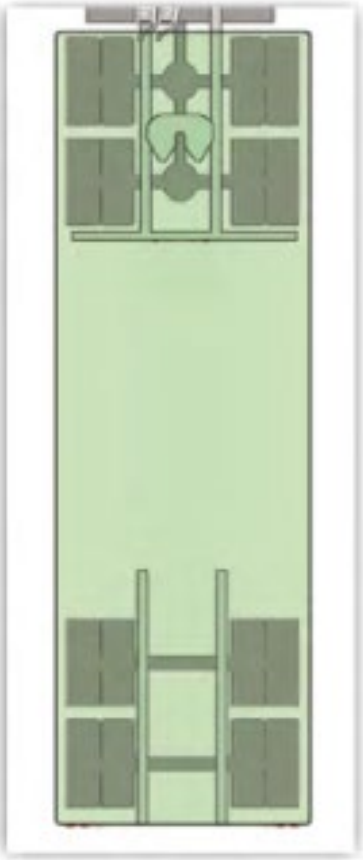
FIFTH WHEEL	
Bolts	
Locking pins	
Coupling plate	
CROSS MEMBERS	
SUSPENSION	
TIRES	
VALVES	
WHEELS	
HUBS	

FIFTH WHEEL	
Bolts	
Locking pins	
Coupling plate	
CROSS MEMBERS	
SUSPENSION	
TIRES	
VALVES	
WHEELS	
HUBS	

JAWS	
PARKING LIGHTS	
TURN-SIGNAL LIGHTS	
BRAKE LIGHTS	
BODY	

SEMI-TRAILER EXTERIOR

KING PIN	
FIFTH WHEEL	
JAWS	
CROSS MEMBERS	



SIDE RAIL	
BODY	

SIDE RAIL	
BODY	

LOCKING PINS	
SUSPENSION	
TIRES	
WHEELS	
VALVES	
HUBS	
WHEEL PARALLELISM (TOE)	

LOCKING PINS	
SUSPENSION	
TIRES	
WHEELS	
VALVES	
HUBS	
WHEEL PARALLELISM (TOE)	

PARKING LIGHTS	
TURN-SIGNAL LIGHTS	
BRAKE LIGHTS	
LICENCE PLATE LIGHT	
COUPLING DEVICE	

TRACTOR INTERIOR

MIRRORS	
WINDSHIELD	
SIDE WINDOWS	
WINDSHIELD WIPERS	
WINDSHIELD WASHER FLUID	
BLOWER	
STEERING WHEEL	
STEERING COLUMN	
HORN	
SEAT	
SEAT BELT	
EMERCENCY MATERIAL	

AIR TESTS (service brake)	
LOW AIR PRESSURE INDICATOR	
PERFORMANCE	
STOP	
AIRTIGHTNESS	
COMPRESSOR SWITCHES ON	

EXHAUST ODOURS	
ACCELERATOR PEDAL	

PARKING BRAKE	
Tractor	
Semi-trailer	
POWER STEERING	
CLUTCH	
SERVICE BRAKE	

Société de l'assurance automobile
Québec

Avec vous,
au cœur de votre sécurité

C-6940 -A (25-12)