Competency 7

Weighing Techniques

Lesson Objectives:

- Be able to analyze and apply weighing techniques
- Know the procedure for adjusting the axles and the fifth wheel

Usefulness of scales

In the trucking world, scales are used for two purposes. The first is for legal reasons, in order to control the weight of vehicles on the road network. The second is for commercial purposes, i.e. for the sale of products in bulk. Depending on their use, scales differ a little in design from one to the other.

The truck driver must ensure that the weight of their load is legal before getting on the road. Private scales are the best tools to meet this need.

Get the maximum payload

To ensure the maximum payload, the driver must first weigh the vehicle when it is empty. At this point, he must take into account the amount of fuel in the tanks, as there is a big difference in weight between empty and full tanks. Diesel weighs 845 g / litre
(7 lbs / US gallon), or about 675 kg for tanks that hold 800 litres of fuel.

Then, the driver simply subtracts the empty weight from the maximum total legal loaded weight and he will know the maximum legal weight of the load he can put in his vehicle (maximum payload).

If a scale is not available prior to loading, the driver will add the weight of the tractor and semi-trailer as recorded on the vehicles' registration certificates. On the other hand, important variations are to be expected, because all the material on board is not accounted for at this time (tools, securement equipment, luggage, groceries, diesel, etc.).

Types of scales

There are several types of scales that truckers have to work with, but overall, there are three different uses for them.

1. **Scales for roadside checks**
   Those scales are there to enforce regulations related to load standards. These types of scales have several platforms on which the vehicles are weighed in axial and total mass, regardless of their configuration. Some weigh stations are equipped to weigh moving trucks and can thus keep trucks moving.

   These checkpoints are installed at strategic locations. Bypassing these posts is prohibited.

   Several provinces and states also use mobile scales with which makeshift checkpoints can be set up.

2. **Public scales**
   These scales are most often used to ensure the conformity of the load distribution on the axles. There is a user fee attached to them. These expenses are reimbursed by the employer.

3. **Company scales**
   For the trucker, these scales have the same utility as public scales, but without the user fee. For companies, these scales are used to control incoming and outgoing material. Thus, the incoming truck is weighed empty on entry and will be weighed upon exit.

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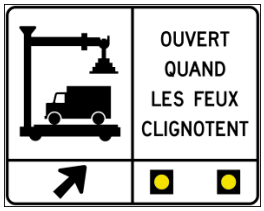
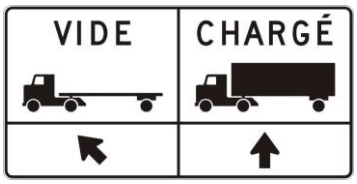
Different procedures for passing over the scales

The approach to a scale.

1. **Scales for roadside checks**
   Procedure:



   1. Upon seeing this sign, heavy vehicles must proceed to the checkpoint if the lights are flashing.



   2. Upon arrival at the checkpoint, the driver must select the lane depending on whether the vehicle is loaded or empty.
      No matter how much cargo there is, as soon as there is a load, the vehicle must take the loaded vehicle lane.
      All unloaded vehicles or bob tails must pass on the EMPTY side.

   3. The choice of lanes.

      A. Loaded truck:

         a. Before getting on the scale, the driver must come to a complete stop and wait for the previous vehicle to be completely off the scale, and then proceed with the weighing.

         b. When getting on the scale, the driver pay attention to the light signals. It is advisable to roll down the window a little and listen to any instructions that may be given. The maneuver should be done slowly and the brakes should be applied gently. Once the truck is stopped, you must release the brakes while keeping your foot above the pedal.
         Since the scale is equipped with several platforms, the axial and total weighing will be done at the same time.

         c. The driver must conform to the light signals, that is, stop while the light is red, move forward or backward according to the arrows, or park their vehicle on the side and go see the controller. The green light indicates that the driver may proceed.

      B. Empty truck (bob tail):

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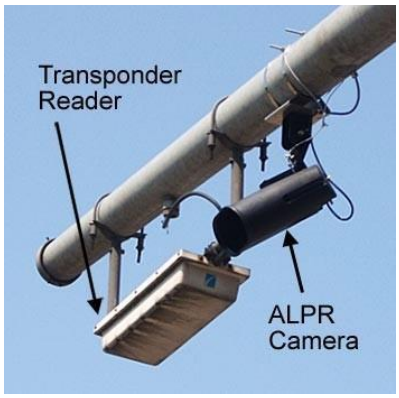
a. Take the empty truck lane, make a complete stop and go.
Even in the empty truck lane, it is recommended that you remain aware of any instructions that may be given to you, as the driver.

Commercial Vehicle Information Systems and Networks (CVISN)

The Commercial Vehicle Information Systems and Networks (CVISN) program was created to address the common need to move freight safely, legally and economically.

With the help of weigh-in-motion, automatic vehicle identification and automated license plate readers, commercial vehicles are electronically monitored approximately 800 meters from the weigh station. Trucks' weight, size, registration and safety record are checked in milliseconds. Then, a signal to bypass the weigh station or report to that station is sent to the vehicle. If a vehicle cannot be identified by a transponder or with its license plate, a message warns the driver to report to the weigh station.



That system is widely used in weigh stations throughout the United States highway system. In Canada, the system has been implemented in several provinces, and Quebec is currently exploring its implementation.

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2. Public scales

1. The driver places their entire vehicle on the scale and stops in front of the microphone. They will then be asked for their name, company name and unit numbers.
   The entire vehicle will be weighed at once. Normally, that type of scale has several platforms.

2. The driver must go and see the clerk. Once the fee is paid, the clerk will give back the weigh-in ticket.

3. If necessary, the driver will make adjustments to the axles and repeat the weighing process. There is no additional cost for the second passage.

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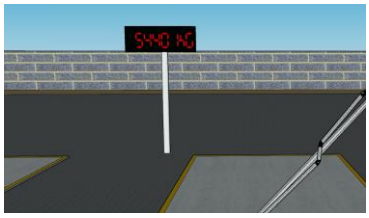
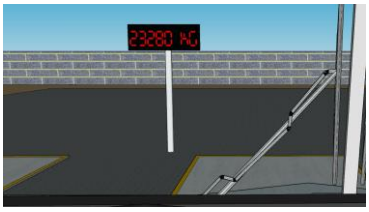
3. Company scales

1. These scales are made up of a single platform, whose purpose is to measure the total mass of the vehicle. However, there is a way to measure the axial mass.
   A. Load the steering axle and enter its weight.



   B. Load the driving axles, enter their weight and subtract the weight of the steering axle. The result is the weight of the driving axles.



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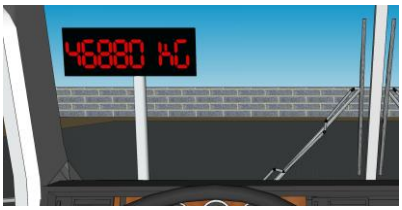
C. Load the axles of the semi-trailer and subtract the weight of the driving and steering axles. The result is the weight of the semi-trailer's axles.



NB. The brakes must be released in each weighing session, otherwise the results could be inaccurate.

2. There are also short platform scales, like the one at the CFTR. With such a scale, each group of axles is weighed one after the other, and the scale adds them up to get the total legal loaded weight.

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4. The dials

Although optional, the suspension air pressure dial is very useful when used judiciously. The greater the load on the suspension, the greater the pressure in the suspension. The driver must make connections between the dial reading and the scale reading when they weigh their truck.

For example, the driver loads the driving axles on the scale. The latter reads 18,000 kg and the dial reads 72 psi. That last reading tells the driver that they should not exceed this pressure, as they would risk being overloaded. Be careful, as the reading of this dial is an indication only and it can vary from one truck to another.

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5. **On-board scales**

On-board scales are scales installed directly on the vehicle. They are used extensively with trucks transporting bulk materials. Since this type of load is estimated during loading, the vehicle may find itself overloaded. With on-board scales, the driver is able to
know the precise weight of their vehicle on each of its axles.

Axle and fifth wheel adjustments

The fifth wheel

On some tractors, it is possible to adjust the position of the fifth wheel to change the weight distribution. Sliding the fifth wheel will change the weight distribution exclusively between the steering and driving axles. Sliding the fifth wheel will not have any effect on trailer tandems. By sliding the fifth wheel forward, the weight increases on the steering axle and takes the weight off the driving axles. Moving the fifth wheel to the rear of the tractor has the opposite effect. Certain factors influence the weight shift when moving the fifth wheel. However, we can say that there is a displacement of + or - 100 kg per hole of the sliding beam (at 4 inches / 10 cm approximately).

Adjust it and forget about it!

Unlike what trailer tandems require, moving the fifth wheel is something you will rarely do. The reason is simple: there is an ideal place to position the fifth wheel on the tractor. Once properly adjusted, the fifth wheel does not necessarily need to be moved.

It may be necessary to move the fifth wheel for the following reasons:

- Spread the load;
- Reduce the wheel base;
- Improve aerodynamics;
- Increase the weight on the steering axle to improve driving (winter);
- Avoid damage to the tractor bed (slopes at loading docks);
- Avoid damage to the trailer landing gear;
- Avoid damaging the fenders.

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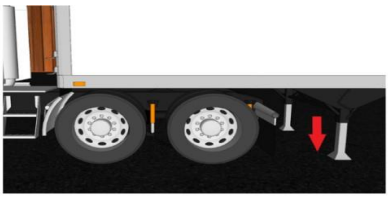
Procedures and method of adjusting the fifth wheel

Put the following steps (elements) in the correct order

Applying brakes



Descendre les béquilles

Lock or unlock pins (x2)

Forward or reverse

Check unlocked pins

Check locked pins

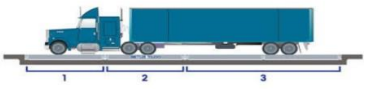
Deflate the suspension

Removing the tractor brakes

Inflate the suspension

Align the truck

Pull up the crutches



Check on the scale

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1.

2.

3.

4.

5.

6.

7.

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11.

12.

13.

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Axle adjustment

Put the following steps (elements) in the correct order

Remove tractor brakes

Forward or reverse

Apply brakes (2x)

Check locking pins

Unlock the locking pins axles

Inflate the suspension

Locking bar or reference point

Deflate the suspension

Check hoses

Check locked pins

Check unlocked pins

Align the truck

Check on the scale

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Competency 7

Loading Standards

Lesson Objectives:

- Take charge of the goods
- Arrange the goods in the vehicle in accordance with load and size regulations

Take charge of the goods

Validate the information

Make corrections

It is possible for the quantities on the bill of lading not to reflect reality or for the mass of the goods to be higher than the payload of the vehicle combination. It is therefore important to make the necessary corrections on the bill of lading.

The arrangement of the goods on the semi-trailer

Axle arrangement of the semi-trailer