Class 1 apprentice training

Commission scolaire
de la Rivière-du-Nord

CHAPTER 3
KNOWLEDGE OF THE VEHICLE

THE INDICATORS

Every driver must be aware of the condition of their heavy vehicle as well as the indicators, buttons, and controls that make up the dashboard. **This way, you ensure that you use your heavy vehicle optimally and safely.**

Control:

- Air supply of the semi-trailer
- Wipers and windshield washer
- Handbrake of the semi-trailer
- Parking brakes
- Gear selector

Indicator.

- Fuel level
- Coolant temperature
- Speed
- Low pressure
- Oil pressure gauge
- Compressed air gauges for the primary and secondary circuits
- Tachometer (revolutions per minute gauge)

THE ACCELERATOR

The accelerator is the tool that allows the driver to control the speed of the vehicle. To move the vehicle smoothly, you should **gradually press the accelerator**. The position of the foot on the pedal is important. The foot should be flat on the pedal, and the heel should touch the floor. The optimal performance of an engine is achieved through an adequate mixture of fuel that enters it. Although injection systems are equipped with increasingly efficient regulation devices, the accelerator pedal still plays a role in this mixture. Therefore, you should gradually press the accelerator according to the engine speed. **Once you reach the desired speed, maintain that speed consistently to keep control of the vehicle.**

THE TRANSMISSIONS

Automatic transmission

Gear changes are made based on the speed of travel or the force of acceleration, through certain mechanical, electronic, or hydraulic controls.

You will notice that, unlike the automatic **transmissions of cars**, the automatic transmissions of heavy vehicles do not have a Park position. Therefore, make sure to place the gear selector in the N (neutral) position when the engine is running and use the parking brake to secure the wheels. Another important point is that, in first and second gear, the driving wheels can lock on a slippery road during deceleration or downshifting. **This situation can lead to a loss of control of the vehicle.**

THE TRANSMISSIONS

Automated manual transmission

The automated manual transmission is increasingly present in the new generations of heavy vehicles. This type of transmission continuously monitors various factors that influence gear shifting, including changes in incline, the weight of the vehicle, its speed, and rolling resistance. Analyzing these factors allows this "intelligent" transmission to detect the moment when the various engine parameters are in the best conditions for a smooth transition from one gear to another.

THE TRANSMISSIONS

Manual Transmissions

Heavy vehicles can be equipped with two types of manual transmissions: synchronized or unsynchronized. The manual transmission (as well as some automated manual transmissions) is equipped with a pedal that allows you to engage or disengage the clutch.

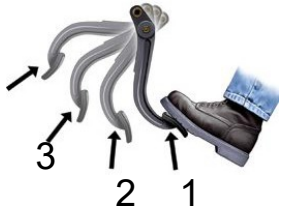
Synchronized Manual Transmission

The synchronized manual **transmission typically has five to six gear ratios**. Using this transmission requires a clutch pedal similar to that of a passenger vehicle and does not necessitate the use of the double clutching technique.

Unsynchronized Manual Transmission

This type **usually has 8 to 18 gear ratios**. It is necessary to use the double clutching technique for safe and optimal operation.

THE CLUTCH PEDAL HAS FOUR POSITIONS



The clutch pedal of the unsynchronized **manual transmission has four positions**, each associated with specific roles. The proper and optimal use of the double clutching technique requires an understanding of the functions of these four positions:

- **Free play**: This is the part that prevents certain components from being constantly in rotation, thereby creating unwanted friction.
- **Friction point**: This position allows you to disengage the engine from the transmission before changing gears.
- **Lower play**: This is the interval (the play) that allows you to transition to the clutch brake.
- **Clutch brake**: This position is used to immobilize certain parts of the transmission to engage the first gear.

A GOOD RPM IS ALSO IMPORTANT... FOR THE ENGINE

An engine that does not run fast enough causes jolts that can damage the vehicle. Furthermore, if it runs at its maximum RPM, it consumes fuel unnecessarily and does not provide more power than if it were running at a lower RPM.

All engines have a maximum RPM. Therefore, it is beneficial to shift gears before the engine reaches this limit. Thus, for substantial fuel savings, you would benefit from using the method of gradual gear shifting.

The tachometer is a useful instrument for making gear changes at the right moment, and in this regard, it is more accurate than the sound of the engine and the speed of the vehicle.

SPEED LIMITATION = FUEL SAVINGS

It is on the highway that you can best control your vehicle's fuel consumption. Therefore, it is recommended not to exceed 90 km/h in order to minimize wear on the engine, tires, and brakes while saving fuel.

THE BRAKING SYSTEM

Braking systems are composed of mechanical elements that are primarily activated by the pressure of a **liquid (hydraulic system) or by the pressure of compressed air (pneumatic system).**

- **A service brake**, which allows the driver to reduce the speed of the vehicle or the entire combination of vehicles using the brake pedal.
- **A parking brake**, which keeps the vehicle stationary when it is parked.
- **An emergency brake**, which is used to immobilize the vehicle in the event of a failure of the service braking system or a break in the coupling.

THE CONTROLS AND INDICATORS OF THE HYDRAULIC BRAKING SYSTEM

- The brake pedal

The brake pedal allows you to engage the service brake to slow down or immobilize your vehicle. **When the brake pedal is abnormally low, it is a serious warning signal.**

- The service brake warning light

If the warning light remains on while the engine is running, it may indicate that the hydraulic system is faulty.

- The parking brake warning light

A light comes on when the parking brake is engaged.