

## INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

Fourth School Year

**ROAD VEHICLES**

1. **Road vehicles** are equipment driven by the power of engines. Their **purpose** is to transport **goods** and people along roads.

The vehicles are driven by **combustion engines**, electrical engines or a combination of both.

2. **Combustion engines** are categorized as:

a) **Piston engines**

- They can be:
- with a **reciprocal piston motion**
  - with a **circular piston motion**

**Piston engines** most often use crank mechanisms for the transfer of a direct, **reciprocal piston motion** into a rotating **motion** and for mechanical work.

**Combustion engines** burn **liquid** or **gaseous** fuel. The **liquids** include petrol and diesel. Among **gaseous** fuels there are mostly CNG (Compressed Natural Gas), propane, butane and ethanol. The most often used fuel is petrol and diesel, and in some countries ethanol. In Europe, about 5% ethanol is mixed into petrol.

3. **Motor vehicles** are made up of these parts:

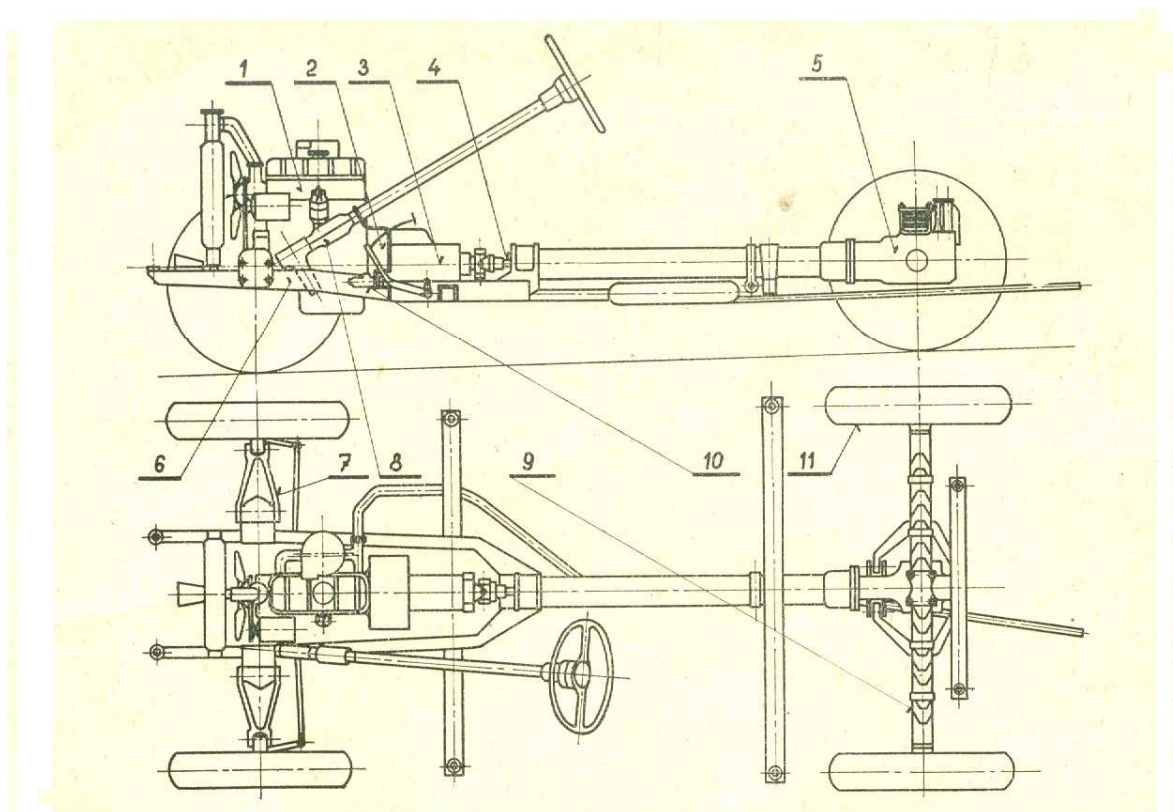
- I. Motor** - It is the driving unit. It is used for transferring fuel energy into mechanical work.
- II. Clutch** - It **ensures** motor **separation** from the **transmission** while the engine is running. It also **ensures** the transfer of **torque**.
- III. Transmission** - It is equipment which transfers the **torque moment** of the motor to the wheels of the vehicle.
- IV. Distribution system** - It enables rotation **reduction** and **increases torque moment** to the wheels. The **differential gear** helps the **torque moment** to be **uniformly** distributed to the wheels.
- V. Body (vehicle frame)** - It is the **load bearing** unit, in which the above mentioned parts are **attached** to the **axle**.
- VI. Steering control** - It is used to **maintain** the driving direction of the vehicle.
- VII. Brakes** - They have the job of slowing down or stopping a vehicle. For passenger cars there are **liquid**, parking and mechanical brakes and for **trucks** there are air **brakes**.
- VIII. Wheels** - They transfer the **torque moment** into advance **motion** along roads.

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### 4. Mechanical *underbody* of a car

In picture 1 you can see the position of some of the above mentioned parts on the *underbody* of a car (including other parts).

**1-motor 2 clutch 3 transmission 4 propeller shaft 5 distribution system 6 frame 7 swinging axle 8 steering control 9 suspension 10 brakes 11 wheels**



*Literature used: 1. Stavba a provoz strojů – Adámek, Hofírek*

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### VOCABULARY

<b>advance motion</b>	posuvný pohyb	<b>motion</b>	pohyb
<b>attached</b>	uchycený	<b>piston</b>	píst, pístový
<b>axle</b>	náprava	<b>piston engine</b>	pístový motor
<b>brake</b>	brzda	<b>propeller shaft</b>	spojovací hřídel
<b>burn</b>	spalovat, hořet	<b>purpose</b>	účel
<b>circular</b>	krouživý	<b>reciprocal</b>	vratný
<b>clutch</b>	spojka	<b>reduction</b>	snížení
<b>combustion engine</b>	spalovací motor	<b>road vehicle</b>	silniční vozidlo
<b>differential gear</b>	diferenciální převod	<b>separation</b>	oddělení
<b>distribution system</b>	rozvodovka	<b>steering control</b>	řízení
<b>ensure</b>	zajišťovat	<b>suspension</b>	pérování
<b>frame</b>	rám	<b>swinging axle</b>	výkyvná náprava
<b>gaseous</b>	plynný	<b>torque</b>	krut
<b>goods</b>	zboží	<b>torque moment</b>	kroučící moment
<b>increase</b>	zvýšit	<b>transmission</b>	převodovka
<b>liquid</b>	kapalný, kapalina	<b>truck</b>	nákladní vůz
<b>load bearing</b>	nosný	<b>underbody</b>	podvozek
<b>maintain</b>	udržet, zachovat	<b>uniformly</b>	rovnoměrně

### COMPREHENSION QUESTIONS

1. What is a road vehicle and what is its purpose?
2. How are piston engines categorized?
3. What fuels do you know? Can you name examples?
4. Can you name the parts of a motor vehicle?
5. What is the main job of brakes?

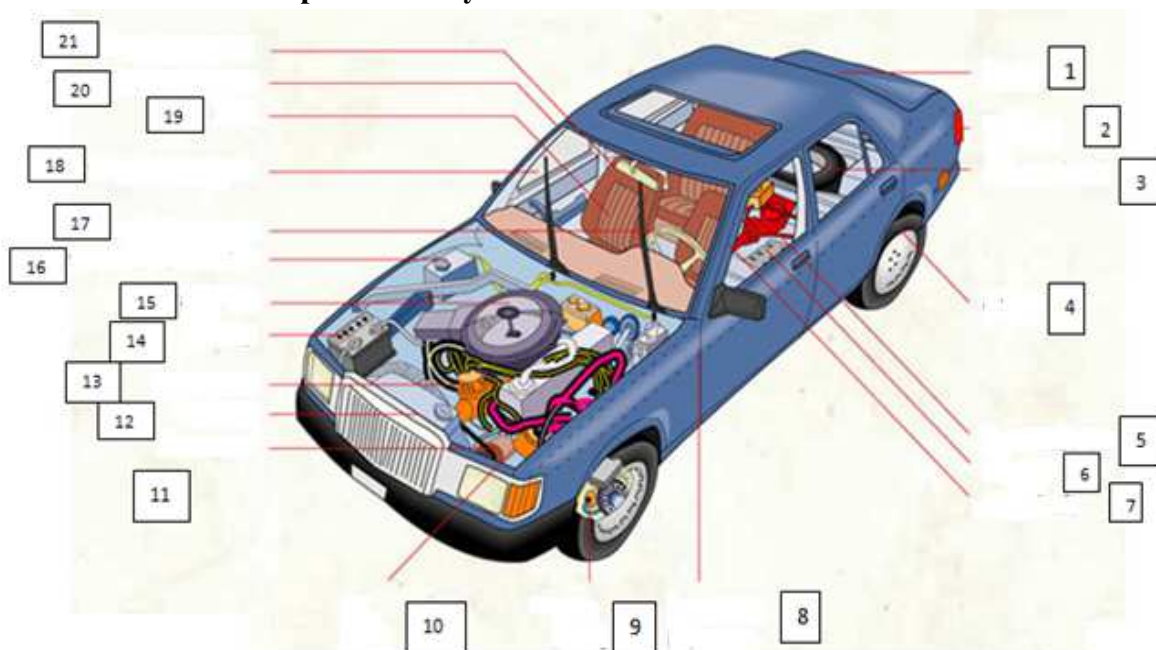
## INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

### EXERCISES

#### 1. Rearrange letters to make words:

The vehicles are driven by \_\_\_\_\_ (smoucbpoint) engines. Piston engines can by with a \_\_\_\_\_ (rreiccalpo) piston motion. Piston engines most often use crank \_\_\_\_\_ (mmssechain). Combustion engines burn \_\_\_\_\_ (qiildu) or \_\_\_\_\_ (oussage) fuel. The most often used fuel is \_\_\_\_\_ (oterlp) and \_\_\_\_\_ (eseild), in some countries ethanol. In Europe, about 5% \_\_\_\_\_ (hnaoetl) is mixed into petrol.

#### 2. Can you name any other car parts apart the mentioned in the text above? Add the labels to the individual parts and try to translate.



	radiator		windscreen washer	
	air filter		alternator	
	trunk		tail light	
	disk brake		transmission	
	steering wheel		radiator	
	muffler		wheel	
	windscreen wiper		window frame	
	distributor		body side moulding	
	oil filter		battery	
	spare wheel		seat	
	line shaft			

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### 3. Change the form of the words from the text to the following form:

1. battery – pl. \_\_\_\_\_
2. gaseous – noun \_\_\_\_\_
3. reduction – verb \_\_\_\_\_
4. mechanical – adverb \_\_\_\_\_
5. piston – adjective \_\_\_\_\_
6. maintain – noun \_\_\_\_\_
7. uniformly – adjective \_\_\_\_\_
8. transmission – verb \_\_\_\_\_
9. clutch – pl. \_\_\_\_\_
10. motion – verb \_\_\_\_\_

## INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

### EXERCISES – Key for teachers only

1. The vehicles are driven by *combustion* (smoucboint) engines. Piston engines can by with a *reciprocal* (rreiccalpo) piston motion. Piston engines most often use crank *mechanisms* (mmsscehain). Combustion engines burn *liquid* (quildu) or *gaseous* (oussage) fuel. The most often used fuel is *petrol* (oterlp) and *diesel* (eseild), in some countries ethanol. In Europe, about 5% *ethanol* (hnaoetl) is mixed into petrol.

2.

12	radiator	chladič	16	windscreen washer	ostřikovač
15	air filter	vzduchový filtr	11	alternator	alternátor
1	trunk	kufr	2	tail light	zadní světlo
9	disk brake	kotoučová brzda	5	transmission	převodovka
17	steering wheel	volant	12	radiator	chladič
6	muffler	tlumič	4	wheel	kolo
18	windscreen wiper	stěrač	20	window frame	okenní rám
13	distributor	rozdělovač	8	body side moulding	boční ochranné lišty
10	oil filter	olejový filtr	14	battery	baterie
3	spare wheel	rezerva	19	seat	sedadlo
7	line shaft	transmisní hřídel			

3.

- |                          |                     |
|--------------------------|---------------------|
| 1. battery – pl.         | <b>batteries</b>    |
| 2. gaseous – noun        | <b>gas</b>          |
| 3. reduction – verb      | <b>reduce</b>       |
| 4. mechanical – adverb   | <b>mechanically</b> |
| 5. piston – adjective    | <b>piston</b>       |
| 6. maintain – noun       | <b>maintenance</b>  |
| 7. uniformly – adjective | <b>uniform</b>      |
| 8. transmission – verb   | <b>transmit</b>     |
| 9. clutch – pl.          | <b>clutches</b>     |
| 10. motion – verb        | <b>move</b>         |