

## **Vehicles compound structure**

*(Transporto priemonės junginio sandara)*

Slide 1:

### **Structure of Internal Combustion Engine Components**

*(Vidaus degimo variklių sandara)*

#### **PADALOMOJI MEDŽIAGA MOKYTOJUI**

Slide 2:

The aims of today's lesson are as follows:

Regarding the subject:

- to get acquainted with the structure of the internal combustion engine;
- to learn the functions of the main parts of a four-stroke engine;
- to learn the four-stroke engine working strokes.

You will also develop the English language skills:

- You'll expand subject specific vocabulary by learning the key terms describing
  - the basic components of a 4-stroke engine;
  - the basic components of fuel delivery system;
  - functions of the main parts of a 4-stroke engine.
- to develop listening and reading in English skills

Culture related aims are these:

to get acquainted and compare how teaching material on internal combustion engine is presented in Lithuanian textbooks and in online material in the English language.

Slide 3:

Let's remember some information about the engines that you already know.

#### **How many cylinders do engines usually consist of?**

Engines usually consist of 2, 3, 4, 5, 6, 8, 12 or more cylinders.

#### **How can engines be arranged, in what configurations?**

Engines may be arranged in a straight line (with all of the cylinders placed in a single row), let's

see an example:

[Straight engine](#)

They can also be flat (with multiple pistons that move in the horizontal pane), let's see an example:

[Flat engine](#)

They can be arranged in “V” form (with two banks of cylinders at an angle, most commonly 60 or 90 degrees) and other configurations.

The example of a [V engine](#)

Slide 4:

## VOCABULARY

*Task 1. Before explaining the principles of operation of the four-stroke engine, let's analyse some of the basic active words.*

### Key terms

- **A four-stroke engine** (a 4-stroke engine) - 4 up and down motions are needed to complete the cycle – keturtaktis variklis
- **A shaft** – velenas
- **A valve** – vožtuvas
- **A stroke** – taktas, (stūmoklio) eiga
- **Fuel** - kuras
- **Intake** – įsiurbimas, įleidimas, įtraukimas (dujų, skysčių) (*syn. inlet*)
- **Exhaust** – išmetimas (dujų iš cilindro); išleidimas (garų)
- **To rotate** – sukėti, sukietis (apie ašį), **rotation** – sukimasis, periodinis pasikartojimas (rotacija)

Slide 5:

*Task 2: Find Lithuanian equivalents for each English key word. There are 2 English synonyms which have the same Lithuanian equivalent. Which ones?*

1. **a four-stroke engine**
2. **a shaft**
3. **a valve**
4. **a stroke –**

- A. **sukėti, sukietis (apie ašį)**
- B. **velenas**
- C. **vožtuvas**
- D. **keturtaktis variklis**

5. **intake**
6. **to rotate**
7. **inlet**
8. **exhaust**
9. **rotation**
10. **fuel**

- E. **kuras**
- F. **išmetimas, išleidimas (dujų, garų)**
- G. **taktas, (stūmoklio) eiga**
- H. **įsiurbimas, įleidimas, įtraukimas**
- I. **sukimasis, periodinis pasikartojimas**

Answer key:

1 D

2 B

3 C

4 G

5 H

6 A

7 H

8 F

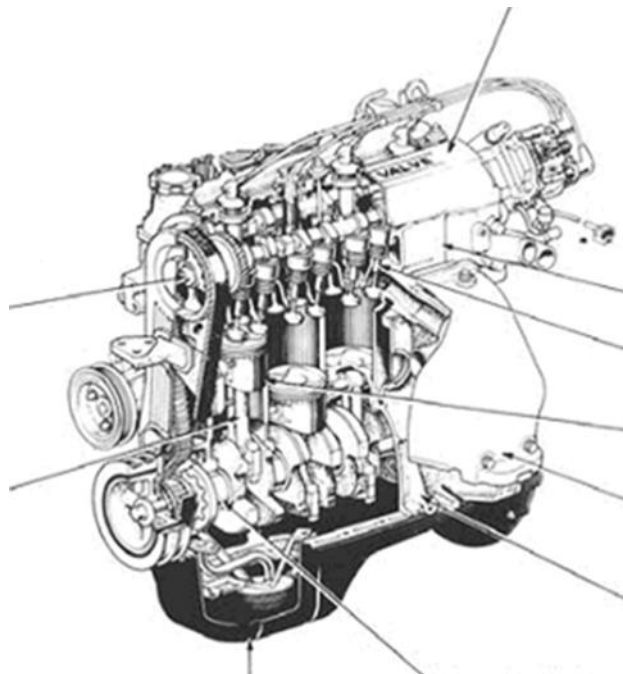
9 I

10 E

2 English synonyms: intake and inlet

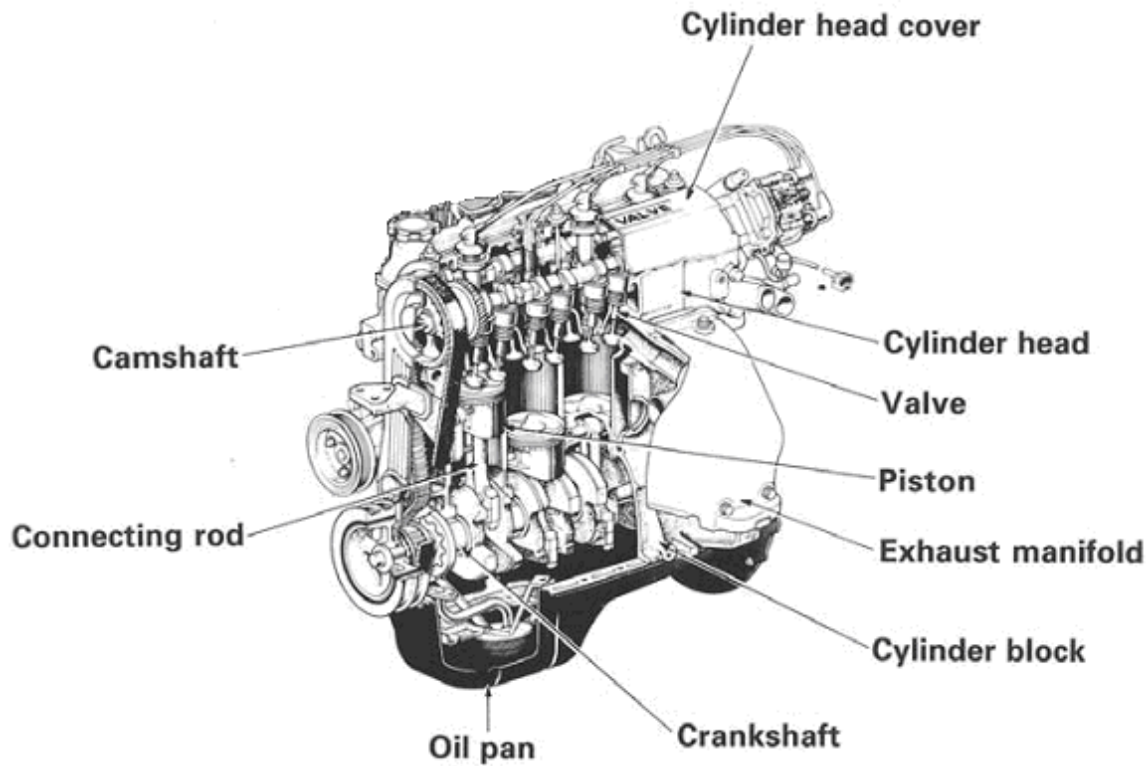
Slide 6:

**Task 3:** Please, write the basic components of cylinder in Lithuanian at the end of each arrow (Kiekvienos rodyklės gale parašykite lietuvišką cilindro detalės pavadinimą)



Slide 7:

*Task 4: Please, analyse the basic components the cylinder in English and compare the terms:*



Slide 8:

**Basic components of every 4-stroke gas engine:**

- **A piston** – stūmoklis
- **A connecting rod** – švaistiklis
- **A crankshaft** – alkūninis velenas
- **A camshaft** – kumštelinis (skirstymo) velenas
- **An exhaust manifold** – išmetimo kolektorius
- **An oil pan** – karteris
- **A cylinder head** – cilindro galvutė
  - **A cylinder head cover** – cilindro galvutės dangtelis
- **A cylinder blok** – cilindro blokas, skriemulys

Slide 9:

## **Animated Engines:**

*Task 5: Get acquainted with different engines by a mouse click.*

<http://www.animatedengines.com/index.html>

*Task 6: Watch the engines and answer the following questions:*

1. Which is the most popular type of engine nowadays?
2. Is there a difference between an Otto Cycle and a 4-stroke cycle?
3. What is the difference between a diesel and a 4-stroke?
4. What does the abbreviation DOHC stand for?
5. Why is it said that diesels are the most efficient engines?
6. Where is a 2-stroke engine used?
7. What is their shortcoming?
8. The Wankel engine has fewer moving parts than the Otto cycle engine, so why isn't it more popular?
9. What is the difference between a Rocket engine and a Turbo jet engine?
10. What are the good points of a Gnome Rotary engine?

Answer Key:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

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