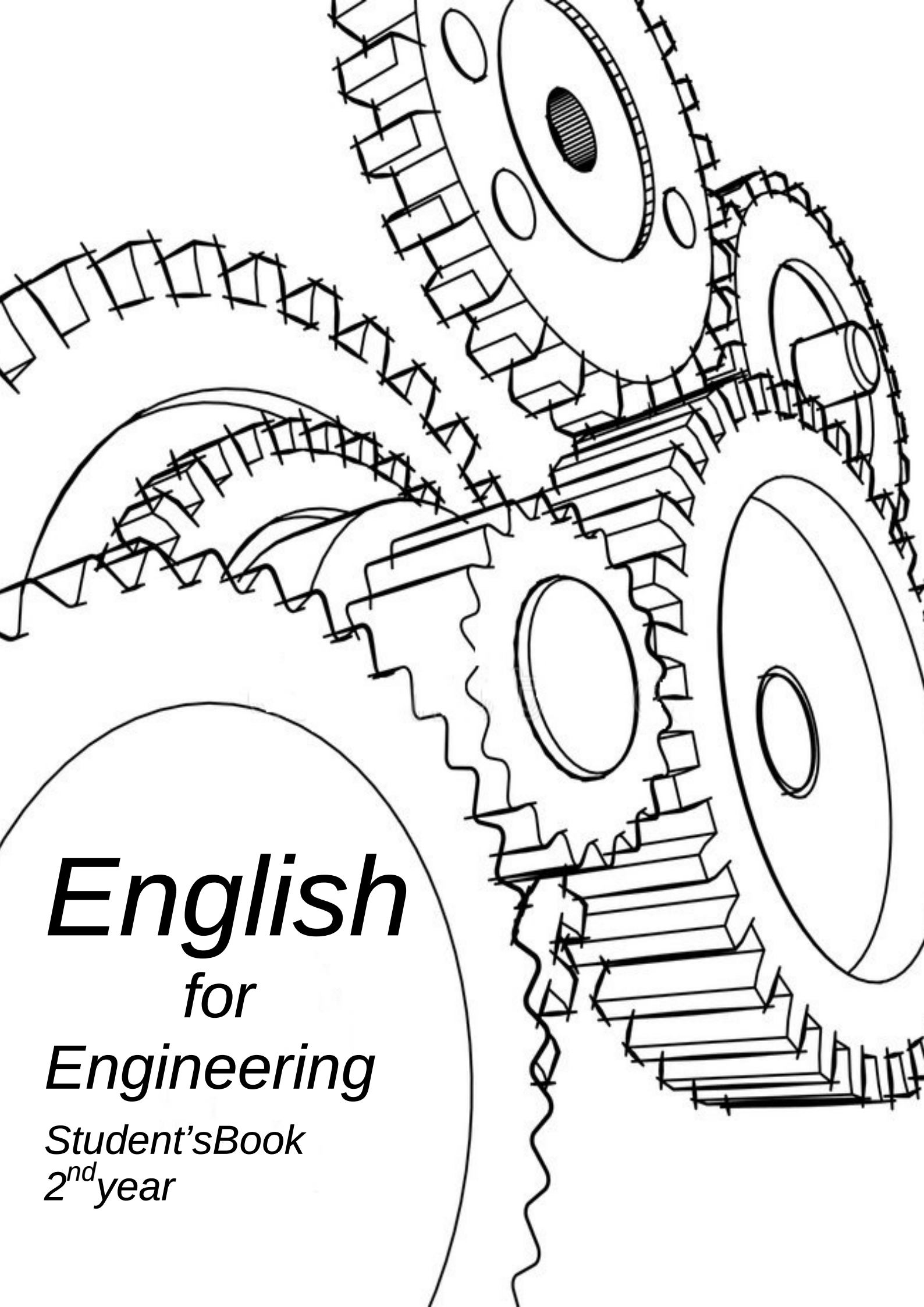


English
for Engineering

Student'sBook
2nd year

Министерство сельского хозяйства Российской Федерации
федеральное государственное бюджетное образовательное учреждение
высшего образования «Вологодская государственная молочнохозяйственная
академия имени Н.В. Верещагина»

Технологический факультет

Кафедра иностранных языков

Т.А. Маркова,
Ю.Н. Малиновская

Английский язык

Учебное пособие
для аудиторной и самостоятельной работы студентов 2 курса
по направлениям подготовки
35.03.06- Агроинженерия,
профиль подготовки – Искусственный интеллект

Вологда – Молочное
2023

УДК 44 (Англ) (071)
ББК 81.2 Англ р30
М19

Рецензенты:
канд. техн. наук, доцент кафедры энергетических средств и технического сервиса
А.Л. Бирюков,
канд. филол. наук, доцент кафедры иностранных языков
В.Л. Попова

Маркова Т.А., Малиновская Ю.Н.

М19 Английский язык: Учебное пособие/ Т.А. Маркова, Ю.Н. Малиновская. – Вологда–Молочное: ФГБОУ ВО Вологодская ГМХА, 2023. – 101 с.

ISBN 978-5-98076-292-6

Настоящее учебное пособие по английскому языку предназначается для аудиторной и самостоятельной работы студентов 2 курса, обучающихся по направлениям подготовки 35.03.06 - Агроинженерия, профиль подготовки – Искусственный интеллект.

Цель данного пособия – ознакомить студентов с лексикой их будущей профессии, а также с грамматическими явлениями, необходимыми для чтения оригинальных научных текстов. Тексты учебного пособия снабжены словарными списками и лексико-грамматическими упражнениями, формирующими способности обучающегося к коммуникации в устной и письменной формах на иностранном языке.

Печатается по решению редакционно-издательского совета ФГБОУ ВО Вологодская ГМХА.

УДК 44 (Англ) (071)
ББК 81.2 Англ р30

ISBN 978-5-98076-292-6

Introduction
Введение

Данное учебное пособие предназначено для аудиторной и самостоятельной работы студентов 2 курса инженерного факультета ФГБОУ ВО Вологодская ГМХА, обучающихся по направлениям подготовки 35.03.06 - Агроинженерия, профиль подготовки – Искусственный интеллект.

Пособие соответствует учебной программе и тематическому плану дисциплины «Иностранный язык».

Цель пособия – познакомить студентов с необходимым минимумом профессиональной терминологии, научить читать и переводить специальные тексты, а также строить высказывания с использованием лексики будущей профессии. Профессиональную направленность пособия обеспечивают задания, содержание которых способствует выходу тренируемых языковых и речевых единиц и явлений в соответствующие виды коммуникативной деятельности. Выполнение заданий пособия ведет к формированию универсальных, общекультурных и профессиональных компетенций.

При создании пособия материал подбирался не только с учетом профессиональных интересов учащихся, но и с точки зрения актуальности его содержания. В пособии использованы оригинальные тексты из современной англоязычной литературы по агроинженерии, адаптированные в соответствии с задачами пособия. Тексты пособия затрагивают следующие темы, соответствующие указанным направлениям подготовки: рабочий цикл четырехтактного бензинового двигателя, дизельный двигатель, система зажигания, система смазки, трансмиссионная система сельскохозяйственного трактора, системы охлаждения, почвообрабатывающее оборудование, уборочный комбайн, орудия для выращивания сельскохозяйственных культур и др.

Пособие состоит из введения и учебно-тематического раздела. Учебно-тематический раздел содержит 13 специальных текстов и 1 разговорную тему, работа над которыми осуществляется на аудиторных занятиях. Для оптимизации процесса изучения текстов каждый из них снабжен кратким словарем и упражнениями, целью которых являются усвоение лексики и грамматики текстов, контроль понимания содержания прочитанного, развитие навыков чтения и устной речи. Есть также задания, цель которых – извлечь важную информацию, сделать собственные выводы. Коммуникативную направленность данному учебному пособию придают диалоги, содержащие лексику, связанную с будущей профессиональной деятельностью.

Данное пособие может использоваться для самостоятельной работы студентов. Поскольку предлагаемые в пособии задания разнообразны и представлены в достаточном количестве, преподаватель, организующий самостоятельную работу студентов, может выбирать и распределять задания

по своему усмотрению. Задания должны предлагаться студентам в порядке нарастания сложности.

При работе с учебным пособием рекомендуется:

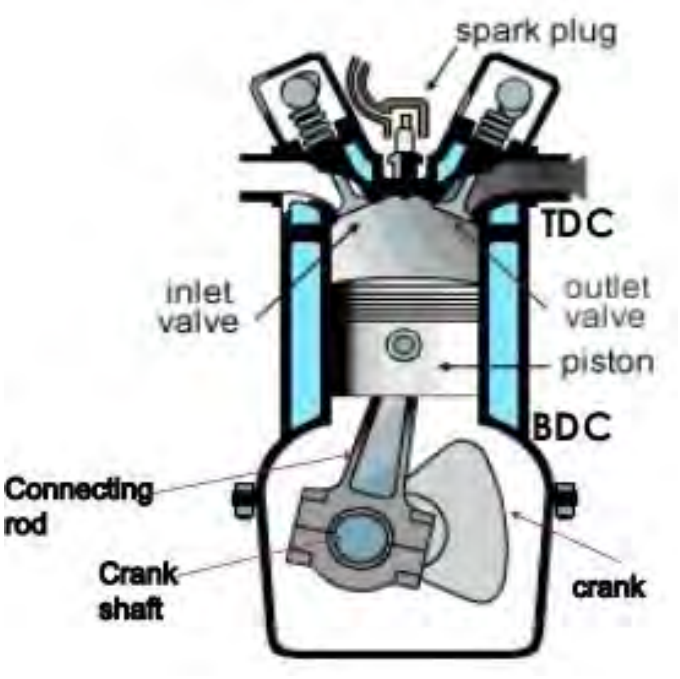
- уделять основное внимание усвоению базовых понятий и категорий;
- анализировать англоязычные тексты, раскрывающие особенности профессиональной терминологии;
- использовать научную и профессиональную терминологию в устных ответах и письменных работах (доклады, проекты, контрольные работы, эссе), что развивает необходимые навыки обращения с понятиями и категориями, способствует их усвоению;
- соотносить полученные знания с имеющимися знаниями из других областей науки, осуществлять межпредметную связь;
- обсуждать проблемные ситуации на иностранном языке.

Авторы

The operating cycle of the four-stroke petrol engine

Рабочий цикл четырехтактного бензинового двигателя

Anyone knows that the motive power in the ordinary petrol engine is produced by igniting above the piston in each cylinder a mixture of petrol vapour and air. The resultant combustion of them causes pressure on the top of the piston. By this means the heat released by the fuel is transformed into rotary movement of a crankshaft by means of the connecting rods.



The four-stroke cycle is an operating sequence more commonly employed. In this case each cylinder should be provided with an inlet valve to admit a combustible mixture of petrol and air drawn by the suction of the engine from a mixing device known as the carburetor into the space above the piston. At the same time the cylinder must also have an exhaust valve to control the outlet through which the residual products of combustion are ejected after they have done their work. To describe the complete cycle in any one cylinder let’s assume that the piston is at the top of its stroke (top dead center, or abbreviated TDC) and the both the inlet and the exhaust valves are closed. As the piston descends the inlet valve opens so that the mixture of petrol and air can flow into the cylinder. This is called the suction (or induction, or intake) stroke. Immediately after the piston has reached its lowest position (bottom dead center, BDC) and begins to rise again the inlet valve is closed and the mixture is compressed by the rising of the piston during the compression stroke. As the piston once again approaches its topmost position an electric spark passes between the points of the spark plug located in the top of the cylinder in the combustion chamber. The spark ignites the mixture. As both valves are closed during combustion, there is a considerable pressure rise: and, as a result, the piston is forced back again down the cylinder. This movement is termed the expansion or power stroke.

Before the piston reaches its lowest point, the exhaust valve is opened, pressure is released, and as the piston again rises it sweeps the residual gas through the exhaust outlet. Then it is led through a silencer to the atmosphere; this is the exhaust stroke which completes the continuously-repeated cycle. Thus it will be seen that there is one power stroke for every four strokes of the piston or two revolutions of the crankshaft.

In brief the cycle events can be summarized as follows:

1. Intake stroke. Intake valve open.
2. Compression stroke. Both valves closed.
3. Expansion or power stroke. Both valves closed.
4. Exhaust stroke. Exhaust valve open.

Do you know these words?

(Знаете ли вы эти слова?)

motive	[ˈməʊtɪv]	*движущий*
to ignite	[ɪgˈnaɪt]	*воспламенять, зажигать*
to cause	[kɔːz]	*заставлять*
to exert	[ɪgˈzɜːt]	*вызывать*
to release	[rɪˈliːs]	*освобождать*
crankshaft	[ˈkræŋkʃɑːft]	*коленчатый вал*
reciprocating	[rɪˈsɪprəkeɪtɪŋ]	*возвратно-поступательный*
means	[miːnz]	*средство*
connecting rod	[kəˈnektɪŋ rɒd]	*шатун*
by means of	[baɪ miːnz ɒv]	*при помощи, посредством*
sequence	[ˈsiːkwəns]	*последовательность*
to require	[rɪˈkwaɪə]	*требовать*
to employ	[ɪmˈplɔɪ]	*использовать*
to provide	[prəˈvaɪd]	*обеспечивать*
to admit	[ədˈmɪt]	*впускать*
inlet valve	[ˈɪnlet vælv]	*впускной клапан*
exhaust valve	[ɪgˈzɔːst vælv]	*выпускной клапан*
combustible	[kəmˈbʌstəbl]	*горючий*
suction	[sʌkʃn]	*всасывание*
to draw (drew, drawn)	[drɔː]	*втягивать, всасывать*
device	[dɪˈvaɪs]	*прибор, устройство*
outlet	[ˈaʊtlet]	*выпускное отверстие*

residual	[rɪˈzɪdjʊəl]	*остаточный*
to eject	[ɪˈʤekt]	*выталкивать*
to occur	[əˈkɜː]	*иметь место, происходить*
to descend	[dɪˈsend]	*опускаться*
charge	[ʧɑːʤ]	*заряд*
to flow(flew, flown)	[fləʊ]	*течь*
to reach	[riːʧ]	*достигать*
to abbreviate	[əˈbriːvɪeɪt]	*сокращать*
to rise (rose, risen)	[raɪz]	*подниматься*
to approach	[əˈprəʊʧ]	*приближаться*
point	[pɔɪnt]	*точка, электрод*
to sweep (swept, swept)	[swiːp]	*сметать, сносить*
spark plug	[spɑːk plʌg]	*свеча зажигания*
thus	[θʌs]	*таким образом*
silencer	[ˈsaɪlənsə]	*глушитель*
revolution	[revəˈluːʃn]	*оборот*

1. Answer these questions:

(Ответьте на эти вопросы):

1. How is the motive power in the ordinary petrol engine produced?
2. What converts the reciprocating movement of the piston into the rotary movement of the crankshaft?
3. What are the inlet and the exhaust valve used for?
4. What is the task of the carburetor?
5. What do the abbreviations TDC and BDC mean?
6. Why is it necessary to have spark plugs in the petrol engine?
7. How many strokes are there in the operating cycle of the petrol engine?
8. What is the first stroke of the cycle?
9. What happens during the first stroke?
10. During which stroke is the mixture compressed by the rising piston?
11. What is the other name of the expansion stroke?
12. What happens during the last stroke of the cycle?

2. Find the English equivalents for the following word combinations in the text.

(Найдите в тексте английские эквиваленты следующих словосочетаний).

1. *движущая сила*
2. *вращательное движение коленчатого вала*
3. *рабочая последовательность*
4. *смесительное устройство*
5. *остаточные продукты сгорания*
6. *находиться в верхней части хода*
7. *верхняя мертвая точка*
8. *поступать в цилиндр*
9. *достигать самого нижнего положения*
10. *нижняя мертвая точка*
11. *воспламенять смесь*
12. *проходить между электродами свечи зажигания*
13. *сжиматься поднимающимся поршнем*
14. *значительное повышение давления*
15. *удалять остаточный газ через выпускное отверстие*
16. *завершать непрерывно повторяющийся цикл*

3. Match the synonyms from the columns.

(Соедините синонимы из колонок).

1. suction stroke	a. to employ
2. to draw	b. to suck in
3. to eject	c. power stroke
4. to use	d. to push out
5. expansion stroke	e. intake stroke

4. Match the antonyms from the columns.

(Соедините антонимы из колонок).

1. top	a. BDC
2. inlet	b. to open
3. TDC	c. bottom
4. to rise	d. high
5. to close	e. down
6. up	f. exhaust
7. above	g. below
8. low	h. to descend

5. Match the words from the columns to make word combinations from the text.

(*Соедините слова из колонок, чтобы образовать словосочетания*

из текста).

1. expansion	a. position
2. combustible	b. stroke
3. rotary	c. cycle
4. connecting	d. movement
5. topmost	e. spark
6. spark	f. rod
7. continuously-repeated	g. mixture
8. electric	h. plug

6. Fill in the blanks using the given words.

(Заполните пропуски, используя данные слова).

sequence	released	abbreviation	top	combustion
petrol	ignites	device	bottom	combustible

1. Gasoline is a highly … substance.
2. At school, Einstein was at the … of his class.
3. Fuel … produces energy to run machines.
4. You had to put the numbers into the right … .
5. From the … of the Empire State Building, you can see the full extent of Manhattan.
6. Highly toxic dioxins were … into the air.
7. The fuel spontaneously … because of the high temperature and pressure.
8. You should not use any personal electronic … , such as a cellphone, while driving.
9. What does the … TDC stand for?
10. A big old car like that eats up … .

7. Match the words with their definitions.

(Подберите к словам соответствующие определения).

1. carburetor	a. the process of burning
2. silencer	b. the highest place or part
3. reciprocating	c. a part of a vehicle that reduces noise from the engine
4. top	d. a series of related things or events, or the order in which they follow each other

5. residual	e. the part of an engine that mixes fuel and air
6. to release	f. able to burn easily
7. to abbreviate	g. remaining after most of something has gone
8. rotary	h. the increase of something in size
9. to ignite	i. to give freedom or free movement to someone or something
10. combustion	j. to cause burning
11. sequence	k. moving backwards and forwards
12. combustible	l. moving around a circle
13. expansion	m. to make a word or phrase shorter by using only the first letters of each word

For your self-study

(Задания для самостоятельной работы)

8. Mark the sentences true (T) or false (F).

(Определите, верно или неверно утверждение).

1. The two-stroke cycle is the operating sequence common in petrol engines.
2. An exhaust valve serves to admit a combustible mixture of petrol and air into the cylinder.
3. The residual products of combustion are ejected through the exhaust outlet after they have done their work.
4. Top dead center is a term used to denote the topmost position of the piston.
5. Both the inlet and the exhaust valve are closed during the intake stroke.
6. During the exhaust stroke the pressure in the cylinder reaches its highest point.
7. There is one expansion stroke for every two revolutions of the crankshaft.
8. The residual gas is pushed out through the exhaust outlet directly to the atmosphere.

9.Complete the sentences choosing the best alternative.

(Заполните пропуски в предложениях, выбрав наиболее подходящий вариант).

1. The heat released by the fuel is transformed into rotary movement of the crankshaft by means of… .
   a. *the valves*
   b. *the connecting rod*
   c. *the piston*
2. The cylinder must have … to control the outlet through which the residual products of combustion are ejected after they have done their work.
   a. *an inlet valve*
   b. *an exhaust valve*
   c. *an exhaust and an inlet valve*
3. The suction stroke is also called the … stroke.
   a. *induction*
   b. *intake*
   c. *expansion*
4. To name the lowest position of the piston the abbreviation … is commonly used.
   a. *BDC*
   b. *TDC*
   c. *LP*
5. Both valves are closed during the … .
   a. *compression stroke*
   b. *power stroke*
   c. *combustion*

10. Translate the sentences into Russian.

(Переведите предложения на русский язык).

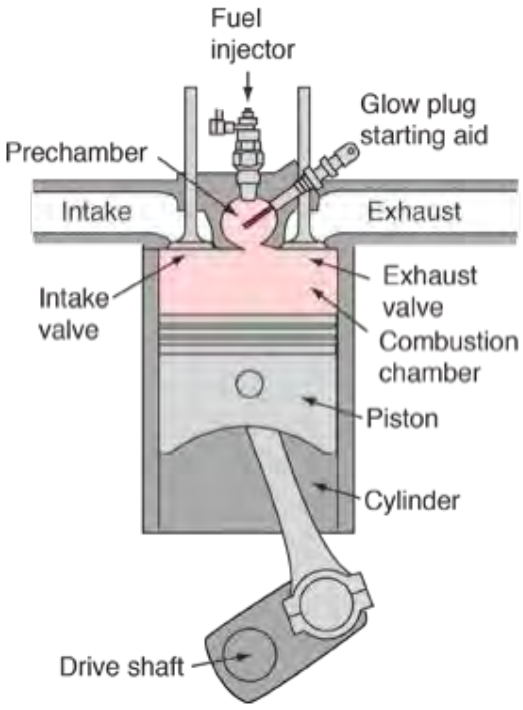
1. Tell the mechanic that the engine was making a strange grinding noise.
2. It's fairly simple to modify the engine to run on lead-free fuel.
3. My car engine overheated because the water had leaked out of the radiator.
4. The boat was about a mile from the shore when the engine suddenly died.
5. Hybrid electric vehicles use two power sources: a conventional engine and an electric motor.
6. The first internal combustion engine light enough in weight was the gasoline engine invented by a German named Otto.

7. The force of the combustion pushes the piston and connecting rod down turning the crankshaft and flywheel which drive other components.
8. As the air molecules are compressed the air temperature increases dramatically to about 1,000°F (537°C).
9. During the power stroke the heat energy is converted into mechanical power.
10. These four strokes are repeated over and over as the engine operates.

How diesel engines work

Как работают дизельные двигатели

When a gas is compressed, its temperature rises; a diesel engine uses this property to ignite the fuel. Air is drawn into the cylinder of a diesel engine and compressed by the rising piston at a much higher compression ratio than for a spark-ignition engine. The air temperature reaches 700-900ºC, or 1300-1650ºF. At the top of the piston stroke, diesel fuel is injected into the combustion chamber at high pressure through an atomizing nozzle, mixing with the hot, high pressure air. The resulting mixture ignites and burns very rapidly. This contained explosion causes the gas in the chamber to heat up rapidly, which increases its pressure, which in turn forces the piston downwards. The connecting rod transmits this motion to the crankshaft. Scavenging (pushing the exhausted gas-charge out of the cylinder, and drawing in a fresh draught of air) of the engine is done either by ports or valves.



A vital component of any diesel engine system is the governor, which limits the speed of the engine by controlling the rate of fuel delivery. Older governors were driven by a gear system from the engine (and this supplied fuel only linearly with engine speed). Modern electronically-controlled engines achieve this through the electronic

control module (ECM) or electronic control unit (ECU) – the engine-mounted “computer”. The ECM/ECU receives an engine speed signal from a sensor and then using its algorithms stored in the ECM/ECU, it controls the amount of fuel and its timing (the “start of injection”) through electric or hydraulic actuators to maintain engine speed.

Controlling the timing of the start of fuel injection is very important for minimizing the emissions and maximizing the fuel economy (efficiency) of the engine. The exact timing of starting this fuel injection into the cylinder is controlled electronically in most of today’s modern engines. The timing is usually measured in units of crank angle of the piston before Top Dead Center (TDC). The optimal timing will depend on the engine design as well as its speed and load.

Do you know these words?
(Знаете ли вы эти слова?)

property	[ˈpropətɪ]	*свойство*
compression ratio	[kəmˈpreʃn ˈreɪʃɪəʊ]	*коэффициент сжатия*
ºC (degrees Centigrade)	[dɪˈgriːz ˈsentɪgreɪd]	*градусы Цельсия*
ºF (degrees Fahrenheit)	[dɪˈgriːz ˈfærənhaɪt]	*градусы Фаренгейта*
to atomise	[ˈætəmaɪz]	*распылять*
nozzle	[ˈnozl]	*форсунка*
to scavenge	[ˈskævɪndʒ]	*продувать (цилиндр), удалять отработанные газы*
governor	[ˈgʌvənə]	*регулятор*
sensor	[ˈsensə]	*датчик, сенсор*
actuator	[ˈæktueɪtə]	*привод*
crank angle of the piston	[kræŋk ˈæŋgl]	*угол поворота коленчатого вала*
Top Dead Center	[ˈtop dedˈ sentə]	*верхняя мёртвая точка*
timing	[ˈtaɪmɪŋ]	*регулирование*
linearly	[ˈlɪnɪəlɪ]	*в прямой (линейной) зависимости*

2. Answer these questions:
(Ответьте на эти вопросы):

1. What does a diesel engine use to ignite fuel?
2. Is the compression ratio in a diesel engine lower than that in a petrol engine?
3. When is diesel fuel injected into the combustion chamber?
4. What is scavenging?
5. What part of a diesel engine system limits the speed of the engine?
6. How is the engine speed controlled?
7. What electronic devices are used in modern engines to control the amount of fuel and the timing of the start of the fuel injection?
8. What are the advantages of the exact timing of starting the fuel injection?
9. What units are used for measuring the timing?
10. What does the optimal timing depend upon?

2. Define the part of speech of the following derivatives, try to guess their meaning, check their translation in a dictionary.
(Определите, какой частью речи являются следующие однокоренные слова, попытайтесь догадаться, как они переводятся на русский язык, проверьте перевод в словаре).
to compress – compression – compressor – compressibility
to ignite – ignition – igniter
to inject – injection - injector
to atomize - atomizer
to explode – explosion - explosive
to control – control – controller - controllable
to time – time - timing - timer
to measure – measure - measurement

3. Explain the meaning of the following abbreviations:
(Объясните значение следующих аббревиатур):
TDC, BDC, ECU, ECM, CI engine, SI engine, PC.

4. Study the meanings of the word ‘unit’ and find in the text 2 sentences having this word. Guess the meanings in which the word is used there.
(Изучите значения слова "unit" и найдите в тексте 2 предложения с этим словом. Угадайте значения, в которых слово в них используется).
Unit-

1. an amount of something used as a standard of measurement. *The watt is a unit of electrical power.*
2. part of a machine. A piece of equipment which is part of a larger machine. *Control / display / filter unit.*

5. Give as many synonyms as you can to each group of the words. You can find some of the synonyms in the above text.

(Приведите как можно больше синонимов для каждой группы слов. Вы можете найти некоторые из синонимов в приведенном выше тексте).

1. to boost, to enlarge, to raise, …
2. mechanism, machine, apparatus, piece of equipment, …
3. contemporary, current, up to date, recent, advanced, …
4. to begin, to set off, to launch, …
5. to keep, to preserve, to continue, …
6. processor, PC, laptop, …
7. to determine, to evaluate, to assess, …

6. Match the words from the columns to make word combinations from the text.

(*Соедините слова из колонок, чтобы образовать словосочетания из текста).*

1. vital	a. speed
2. air	b. temperature
3. compression	c. component
4. engine	d. injection
5. to minimize	e. ratio
6. crank	f. angle
7. fuel	g. emissions

7. Match the antonyms from the columns.

(*Соедините антонимы из колонок).*

1. to rise	a. bottom
2. top	b. to maximize
3. rapidly	c. to fall
4. to increase	d. older
5. modern	e. slowly
6. to minimize	f. to decrease

8. Match the words with their definitions.

(Подберите к словам соответствующие определения).

1. to atomize	a. to choose the exact moment to do something so as to get the best effect
2. diesel engine	b. an engine that burns diesel instead of petrol
3. sensor	c. a short tube fitted to the end of the pipe to direct and control the stream of liquid or gas pouring out
4. charge	d. to change liquid into a mist of very small drops by forcing it out through a very small hole
5. gear	e. a toothed wheel that allows power to be passed from one part of the machine to another so as to control the power, speed, or direction of movement
6. to time	f. an amount of explosive to be fired at one time
7. nozzle	g. a part of a machine that controls how the machine works
8. fuel	h. an apparatus used for discovering the presence of a particular quality or effect, such as light, heat, sound, etc, especially in small quantities
9. governor	i. a material that is used for producing power by burning or by atomic means

9. Fill in the blanks using the given words.

(Заполните пропуски, используя данные слова).

fuel	forward	diesel	gear
	petrol	accident	

1. She changed … to make the car go up the hill faster.
2. Most cars have four or five … gears.
3. More cars, especially in the UK, are now beginning to have diesel engines, as … is less wasteful than petrol.
4. Diesel engine is safer if there is an … and causes less pollution.
5. … is no longer a cheap fuel.
6. Wood, coal, oil, gas, and plutonium are different kinds of ….

10. Find the English equivalents for the following word combinations in the text.

(Найдите в тексте английские эквиваленты следующих словосочетаний).

1. *гораздо более высокий коэффициент сжатия*
2. *в верхней части хода поршня*
3. *впускать свежую порцию воздуха*
4. *контролировать начало впрыска топлива*
5. *поддерживать скорость двигателя*
6. *подавать топливо пропорционально скорости двигателя*
7. *увеличить экономию топлива до предела*
8. *зависеть от конструкции двигателя*

11. Mark the sentences true (T) or false (F).

(Определите, верно или неверно утверждение).

1. When a gas is compressed, its temperature rises.
2. The air temperature in the cylinder of a diesel engine reaches 1,300-1,650°C.
3. Scavenging of the engine is done either by ports or valves.
4. Modern governors allow to supply fuel only linearly with engine speed.
5. ECM or ECU are used in modern electronically controlled engines to control the rate of fuel delivery.
6. The exact timing of starting the fuel injection allows to minimize the efficiency of the engine.

12.Complete the sentences choosing the best alternative.

(Заполните пропуски в предложениях, выбрав наиболее подходящий вариант).

1. When a gas is compressed, its temperature… .
   a. *rises*
   b. *lowers*
   c. *doesn't change*
2. The air temperature in the cylinder of a diesel engine reaches… .
   a. *1,300-1,650°F*
   b. *700-900°F*
   c. *700-900°C*
3. Diesel fuel is injected into the combustion chamber at high pressure through … .
   a. *an opening*
   b. *an atomizing nozzle*

c. a valve

4. … is pushing the exhausted gas-charge out of the cylinder, and drawing in a fresh draught of air.
   a. controlling
   b. optimizing
   c. scavenging
5. Controlling the start of fuel injection allows to maximize… .
   a. the efficiency of the engine
   b. the emissions
   c. the fuel economy

For your self-study

(Задания для самостоятельной работы)

13. Make the sentences Passive.

(Переведите предложения в страдательный залог).

1. The rising piston compresses the air charge in the cylinder.
2. The governor limits the speed of the engine.
3. Electronic devices control the amount of fuel in modern diesel engines.
4. The fuel nozzle shoots a spray of fuel into the chamber full of hot compressed air.
5. Air under pressure blows the exhausted gases out.
6. The release of the exhaust gases reduces the pressure in the cylinder.

14.Translate the sentences. Define the functions of the infinitives.

(Переведите предложения. Определите функции инфинитивов).

1. Electronic devices control the amount of fuel and its timing to maintain engine speed.
2. The explosion causes the gas in the chamber to heat up rapidly.
3. We have to blow the gases out with air under pressure.
4. At this moment the gases start to escape.
5. In order to control the amount of fuel the governor is used.

15.Translate the sentences into Russian.

(Переведите предложения на русский язык).

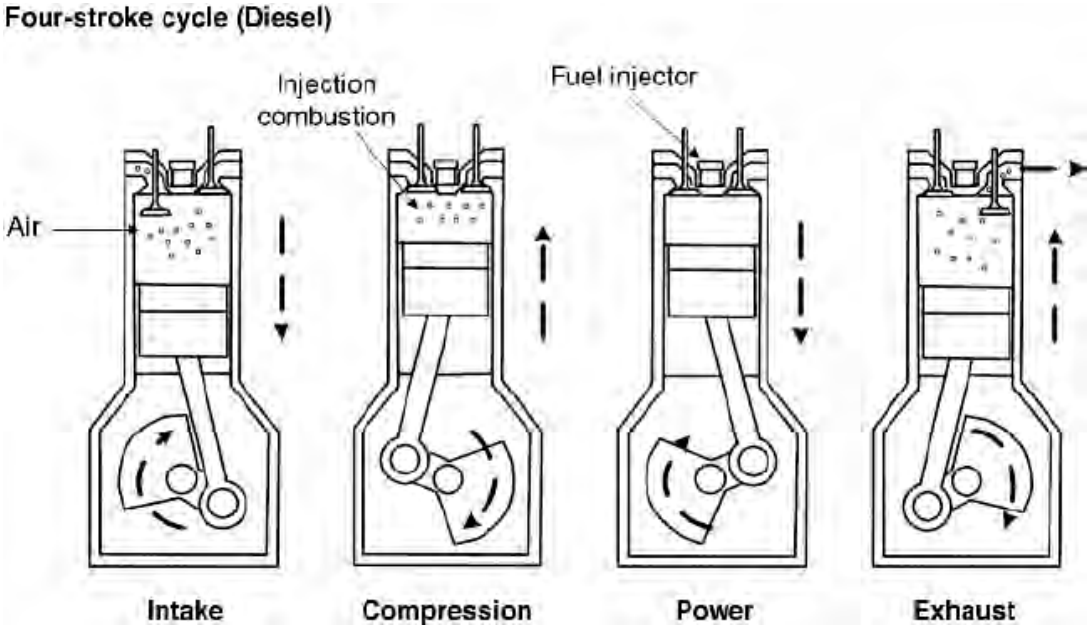
1. No piston or cylinder damage has been reported, suggesting that no pre-ignition or detonation occurred and that the compression ratio was correct for the fuel.

2. The black smoke consists of carbon compounds that were not combusted, because of local low temperatures where the fuel is not fully atomized.
3. Fuel, as a gas or atomized liquid spray, is either mixed with the air in the intake or directly injected into the combustion chamber.
4. By effectively atomizing the fuel prior to combustion, more of the fuel is consumed during the combustion process.
5. The oil is atomized into a fine spray usually by forcing it under pressure through a nozzle.

The diesel engine

Дизельный двигатель

In 1890s, Rudolf Diesel, a German, invented the engine that bears his name. As distinguished from gasoline engines diesels have no ignition system fed with electricity. The fuel is ignited simply by contact with very hot air in the cylinder.



The operation performed is like this: when taken in the cylinder the air is highly compressed, the temperature rises so the heated fuel-air mixture burns. The higher the pressure, the higher the temperature. Besides the compressed mixture produced more power than that uncompressed.

Diesel engines power many of the used vehicles and other equipment. They are usually used in cases where engine weight is not a prime factor. Their advantage is that they are simple in design and use much heavier liquid fuels than gasoline engines. The cost of a heavier

fuel is much less than that of a light one. Besides the fuel consumption of a diesel is much less than that of gasoline engines.

Although applied for many purposes diesel engines have certain disadvantages. Their weight is more than that of a gasoline engine of the same power and it occupies much space. The disadvantages of diesels as passenger-car engines are slow performance, noise and smoke.

All the companies investigating diesels are trying to reduce noise and smoke, but the problems are not yet entirely solved. Diesel engines clatter when started on a cold morning. And the warm-up period for all diesels seems too long to drivers accustomed to gasoline models.

Do you know these words?

(Знаете ли вы эти слова?)

to bear (bore, born)	[beə]	*нести, носить*
to distinguish	[dɪsˈtɪŋgwɪʃ]	*отличать*
to ignite	[ɪgˈnaɪt]	*воспламенять*
ignition	[ɪgˈnɪʃn]	*зажигание*
to feed (fed, fed)	[fi:d]	*питать*
to compress	[kəmˈpres]	*сжимать*
to power	[ˈpauə]	*приводить в действие*
vehicle	[ˈvi:ɪkl]	*транспортное средство*
prime	[praɪm]	*главный, основной*
advantage	[ədˈva:ntɪdʒ]	*преимущество*
disadvantage	[dɪsədˈvɑ:ntɪdʒ]	*недостаток*
liquid	[ˈlɪkwɪd]	*жидкий*
consumption	[kənˈsʌmpʃn]	*потребление*
to apply	[əˈplaɪ]	*применять*
purpose	[ˈpə:pəs]	*цель*
to occupy	[ˈokjupaɪ]	*занимать*
performance	[pəˈfo:məns]	*работа, технические характеристики*
to investigate	[ɪnˈvestɪgeɪt]	*исследовать*
entirely	[ɪnˈtaɪəlɪ]	*полностью, целиком*
to clatter	[ˈklætə]	*стучать (о двигателе)*
to warm up	[wo:m ʌp]	*согревать*
to accustom	[əˈkʌstəm]	*привыкать*

1. Answer these questions:

(Ответьте на эти вопросы):

1. Who invented diesel engine?
2. What is the main difference between gasoline and diesel engines?
3. How is the fuel ignited in a diesel engine?
4. In what cases are diesel engines preferably used?
5. What is the advantage of diesel engines?
6. What are disadvantages of diesels as passenger-car engines?
7. What kind of problems are the companies investigating diesels trying to solve?

2. Define the part of speech of the following derivatives, try to guess their meaning, check their translation in a dictionary.

(Определите, какой частью речи являются следующие однокоренные слова, попытайтесь догадаться, как они переводятся на русский язык, проверьте перевод в словаре).

1. to invent – invention - inventor
2. to operate – operation – operator
3. to compress – compression – compressor
4. to press – pressure
5. to consume – consumer – consumption
6. to perform - performance

3. Read and translate these word combinations:

(Прочитайте и переведите эти словосочетания):

The engine that bears his name, ignition system, to be fed with electricity, the operation performed, warm-up period.

4. Find the English equivalents for the following word combinations in the text.

(Найдите в тексте английские эквиваленты следующих словосочетаний).

1. *система зажигания*
2. *главный фактор*
3. *сжатая смесь*
4. *в отличие от бензиновых двигателей*
5. *нагретая воздушно-топливная смесь*
6. *двигатели пассажирских автомобилей*
7. *плохие технические характеристики*
8. *время прогрева двигателя*

9. питаться от электричества
10. простая конструкция
11. снижать шум

5. Read and translate these sentences. What is common in them?
(Прочитайте и переведите эти предложения. Что в них общего?)
1. The fuel is ignited.
2. The air is highly compressed.
3. The problems are not yet entirely solved.
4. Diesel engine is used in different types of vehicles.
5. The disadvantages of diesels are mentioned in the text.
6. Other characteristics of this engine will be discussed later

6. Translate the sentences into Russian. Find the adjectives in the comparative degree in each sentence:
(Переведите предложения на русский язык. Найдите прилагательные в сравнительной степени в каждом предложении).
1. The higher the pressure, the higher the temperature.
2. Their weight is more than that of a gasoline engine.
3. The cost of a heavier fuel is less than that of a light one.
4. The fuel consumption of a diesel is much less than that of gasoline engines.

7. Complete the sentences using the text.
(Заполните пропуски в предложениях, используя текст).
1. The fuel is … simply by contact with very hot … in the cylinder.
2. The operation performed is like this: when taken in the cylinder the air is highly … the temperature … so the heated fuel-air mixture … .
3. Diesel engines … most of the used vehicles and other equipment.
4. Their … is that they are simple in … and use much heavier liquid fuels than gasoline engines.
5. The … of diesels as … engines are slow performance, noise and smoke.
6. All the companies … diesels are trying to reduce noise and smoke, but the problems are not yet … solved.

8. Fill in the blanks using the given words.
(Заполните пропуски, используя данные слова).

generator	advantage	connect	engine
air	fuel	inventors	last

1. You can save ... by not driving too fast.
2. The van has a 2.5 liter diesel ... .
3. The patent lists six ... who worked on the system.
4. Most batteries ... for about 8 hours.
5. Cars are a major cause of ... pollution.
6. People who have been to university have a big ... when it comes to finding jobs.
7. When the ... shuts off, they have no electricity.
8. Click here to ... to the Internet.

9. Mark the sentences true (T) or false (F).

(Определите, верно или неверно утверждение).

1. Drivers don't normally experience any trouble in starting diesel engines.
2. A diesel engine has a complex design.
3. Diesel engines use a cheaper kind of fuel than gasoline engines do.
4. The main advantage of diesel engines is that they are light in weight.
5. A diesel engine has no ignition system fed with electricity.
6. Diesel engine was invented by the French military engineer Cugnot in 1763.
7. The warm-up period of a diesel engine is quite long.

10.Translate the sentences into Russian.

(Переведите предложения на русский язык).

1. Before leaving, I filled up with fuel at the local petrol station.
2. Is the engine running smoothly?
3. In the following year they were replaced by five more powerful turbines and a larger steam engine.
4. It' s amazing how long this car has lasted, really.
5. You need to put some air into the tires.
6. Do you have any previous experience of this type of work?
7. The interior of the car is all plastic and has a cheap look about it.
8. The car's previous owner didn't take very good care of it.

11.Match the words with their definitions.

(Подберите к словам соответствующие определения).

1. valve
   a. a part of an engine consisting of a short solid piece of metal inside a tube, which moves up and down to make the other parts of the

engine move

2. performance — b. a good feature that something has, which makes it better, more useful than other things
3. advantage — c. a part of a tube or pipe that opens and shuts like a door to control the flow of liquid, gas, or air passing through it.
4. cheap — d. costing very little money, or less than you expected
5. entirely — e. completely, wholly, totally
6. piston — f. manner or quality of functioning

12. Find in the word box the words corresponding to the following definitions. The words are placed horizontally, vertically, and diagonally

(Найдите в сетке слова, соответствующие следующим определениям. Слова расположены горизонтально, вертикально и диагонально).

e	y	e	s	o	p	r	u	p
j	q	i	n	a	e	f	s	c
o	s	u	o	v	l	p	o	i
c	y	l	i	n	d	e	r	n
h	i	r	s	p	u	g	i	v
u	d	n	e	s	m	o	k	e
v	e	h	i	c	l	e	p	n
k	l	w	m	y	r	v	n	t
t	c	l	a	t	t	e	r	t

1. a sound especially one that is loud or unpleasant or that causes disturbance
2. a piston chamber in a steam or internal combustion engine
3. to create something (new ideas, machines, etc.)
4. the necessary items for a particular purpose
5. to make a rattling noise, especially as a result of movement
6. a visible suspension of carbon or other particles in air, typically one emitted from a burning substance
7. a person who drives a vehicle
8. a machine with an engine, that carries people or things from place to place

For your self-study

(Задания для самостоятельной работы)

13.Translate the sentences into Russian, define the part of speech of the words in italics.

(Переведите предложения на русский язык, определите часть речи выделенных курсивом слов).

1. Many people tried to improve the engine *design*.
2. We *design* various devices to improve fuel economy.
3. Diesel engines *power* many different machines.
4. It is important to use engine *power* effectively.
5. You shouldn't *smoke* here.
6. The companies investigating diesels try to reduce *smoke*.
7. It is difficult to work here because of the constant *clatter* of the machines.
8. Diesel engines *clatter* when started on a cold morning.
9. This engine uses the *heat* of compression to ignite the fuel-air mixture.
10. Compression is used to *heat* the fuel-air mixture.

14. Complete the sentences choosing the best alternative.

(Заполните пропуски в предложениях, выбрав наиболее подходящий вариант).

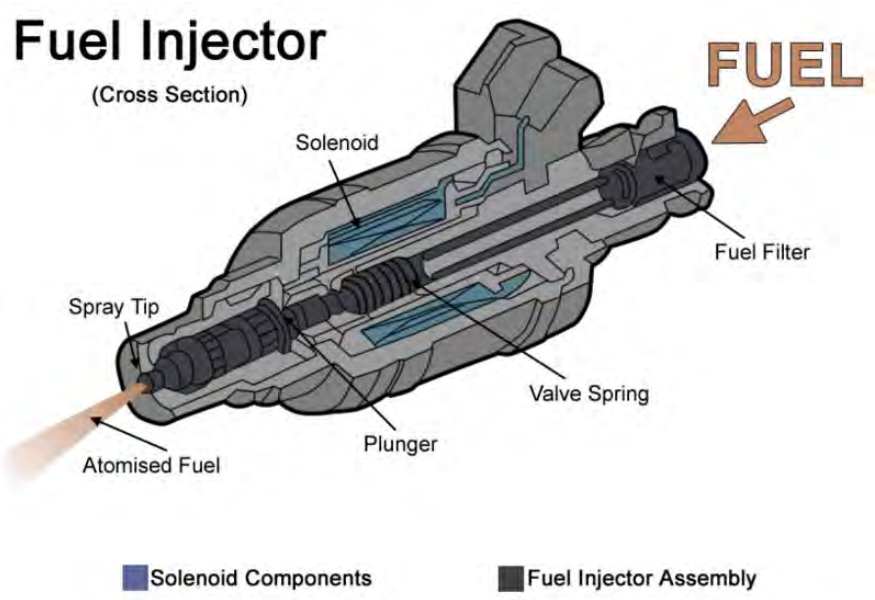
1. The fuel in diesel engines is ignited due to… .
   a. *its contact with very hot air in the cylinder*
   b. *ignition system fed with electricity*
   c. *low pressure in the cylinder*
2. The fuel consumption of the diesel engine is … that of gasoline engines.
   a. *greater than*
   b. *less than*
   c. *the same as*
3. … is a disadvantage of diesel engines.
   a. *slow performance*
   b. *simple design*
   c. *longer warm-up period*
4. … is an advantage of diesel engines.
   a. *substantial weight*
   b. *cheaper fuel*

c. simple design

5. The companies investigating diesels are trying to reduce… .
   a. noise
   b. smoke
   c. engine performance

A comparison of spark ignition and compression ignition engines

Сравнение двигателей с искровым зажиганием и двигателей с воспламенением от сжатия



CI and SI engine uses. The gasoline engines have been most useful in automobiles, light trucks, and in the wheel-type tractor. The diesel or oil burning engine has been most popular in boats, in locomotives, and in powerhouses. As the speed of the diesel engine has been increased, it has been used in more farm tractors, particularly in those of the crawler type. Because of other characteristics the diesel engine is gaining favor for the row or wheel type of farm tractor.

What, essentially, are the differences between the CI and SI engines?

The SI fuel system. One of the main differences is how the fuel is mixed. In the SI engine we must provide a carburetor or mixer. This is a device for mixing air with fuel. There are several hundred different carburetors in use. Some are quite simple and others are extremely complicated. One characteristic of most carburetors is that they must be in operation almost on a level or the liquid fuel will leak out. This sometimes causes faulty operation when the tractor SI engine is tipped at a considerable angle or when the farm truck goes around a corner.

The CI fuel system. The CI engine does not have a carburetor. The

fuel is not mixed with the air outside of the cylinder space as in the SI engine. As a substitute for the carburetor, a pump and an injector are used. Injectors and pumps are very precise instruments. There is an injector or nozzle for every cylinder. Their purpose is to prevent the air within the combustion chamber from leaking out but at the same time inject a stream of fuel into the hot compressed gases at the correct time and interval. It is, therefore, apparent that the air and fuel must mix within the combustion space. The correct mixing of the fuel and air in the space above the piston is a difficult design problem.

Do you know these words?

(Знаете ли вы эти слова?)

truck	[trʌk]	*грузовой автомобиль*
powerhouse	[ˈpaʊəhaʊs]	*электростанция*
particularly	[pəˈtɪkjʊləlɪ]	*особенно*
crawler	[ˈkrɔːlə]	*гусеничный*
to provide	[prəˈvaɪd]	*Обеспечивать*
extremely	[ɪksˈtriːmlɪ]	*чрезвычайно*
to leak out	[liːkaʊt]	*вытекать*
faulty	[ˈfɔːltɪ]	*неправильный*
to tip	[tɪp]	*наклонять(ся)*
angle	[æŋgl]	*угол*
substitute	[ˈsʌbstɪtjuːt]	*замена*
precise	[prɪˈsaɪs]	*точный*
apparent	[əˈpærənt]	*явный, очевидный*

1. Answer these questions:

(Ответьте на эти вопросы):

1. Where are gasoline engines mostly used?
2. What device is used for mixing air with fuel in the SI engine?
3. What is used as a substitute for the carburetor in the CI engine?
4. What is the purpose of an injector nozzle?
5. Where must the air and fuel mix in the CI engine?

2. Mark the sentences true (T) or false (F).

(Определите, верно или неверно утверждение).

1. The gasoline engines have been most popular in boats and locomotives.

2. One of the main differences between the CI and SI engines is how the fuel is ignited.
3. The SI engine doesn’t have a carburetor.
4. In the CI engine the air is mixed with fuel outside the cylinder.
5. Injectors and pumps are used in the CI system.
6. All carburetors are simple.
7. Both SI and CI engines are used in farm tractors.

3. Match the words from the columns to make word combinations from the text.

(*Соедините слова из колонок, чтобы образовать словосочетания из текста).*

1.	wheel-type	a.	space
2.	extremely	b.	complicated
3.	precise	c.	tractor
4.	liquid	d.	problem
5.	combustion	e.	fuel
6.	design	f.	instruments
7.	faulty	g.	operation

4. Match the antonyms from the columns.

(*Соедините антонимы из колонок).*

1.	light	a.	proper
2.	simple	b.	heavy
3.	precise	c.	useless
4.	different	d.	inaccurate
5.	useful	e.	complicated
6.	faulty	f.	similar

5. Find the English equivalents for the following word combinations in the text.

(Найдите в тексте английские эквиваленты следующих словосочетаний).

1. *другие характеристики дизельного двигателя*
2. *гусеничный тип трактора*
3. *впрыскивать струю топлива в горячие газы под давлением*
4. *устройство для смешивания воздуха с топливом*
5. *правильное смешивание топлива и воздуха*
6. *сложная конструкторская проблема*

7. *чрезвычайно сложный*
8. *делать поворот*
9. *заменитель для карбюратора*
10. *очень точные инструменты*

6. Complete the sentences choosing the best alternative.

(Заполните пропуски в предложениях, выбрав наиболее подходящий вариант).

1. The gasoline engines have been most useful in … .
   a. *automobiles*
   b. *light trucks*
   c. *powerhouses*
2. The diesel engine has been most popular in … .
   a. *the wheel-type tractors*
   b. *boats*
   c. *locomotives*
3. … is a device for mixing air with fuel.
   a. *pump*
   b. *carburetor*
   c. *injector*
4. Injectors and pumps are very… instruments.
   a. *precise*
   b. *useful*
   c. *complicated*
5. The purpose of the … is to inject a stream of fuel into the hot compressed gases at the correct time and interval.
   a. *carburetor*
   b. *injector*
   c. *pump*

7. Match the words with their definitions.

(Подберите к словам соответствующие определения).

1. faulty	a. a large road vehicle that is used for transporting large amounts of goods
2. truck	b. an electrical generating station
3. substitute	c. a vehicle, for example a crane or tractor, that moves on a track (= a belt of flat plates around a set of wheels) or tracks

4. crawler	d. containing defects; imperfect; not fit for the use intended
5. apparent	e. to lean to one side
6. precise	f. a thing that is used instead of another one
7. to tip	g. accurate, exact
8. powerhouse	h. able to be seen or understood

8. Fill in the blanks using the given words.
(Заполните пропуски, используя данные слова).

substitutes	trucks	faulty
precise	crawler	powerhouse

1. The … supplies electricity to neighboring provinces.
2. … vary greatly in size, power, and configuration, with the smallest being mechanically similar to an automobile.
3. A special touch controller prevents … operation.
4. Cheaper … displaced the product from the world market.
5. The measuring instruments are very … .
6. The advantages of a … tractor are its ability to disperse its weight out over a much greater area than that of a wheeled tractor.

For your self-study

(Задания для самостоятельной работы)

9. Read and translate the text. Find in the text given above the sentences containing similar information. Point out the facts that were not mentioned there.
(Прочитайте и переведите текст. Найдите в предыдущем тексте предложения, содержащие подобную информацию. Укажите факты, которые там не упоминались).

There is a lot of difference between petrol and diesel engine and these are as follows:

1. The petrol engine works on Otto cycle whereas diesel engine works on diesel cycle.
2. In petrol engine the air and petrol are mixed in carburetor and it enters into the cylinder. In diesel engine the fuel is first fed into the cylinder by a fuel injector and then gets mixed with air inside the cylinder.

3. In petrol engine first the compression of air and petrol is done and then it is ignited by an electric spark. In diesel engine only the charge of air is compressed and ignition is done by the heat of compressed air.
4. The compression ratio in petrol engine is low as compared with the diesel engine.
5. The power developed in petrol engine is low due to lower compression ratio. In diesel engine the power developed is more due to higher compression ratio.
6. Petrol engine is fitted with spark plug whereas diesel engine is fitted with a fuel injector.
7. In petrol engine the fuel that burns has high volatility. In diesel engine the fuel of less volatility is burnt.
8. Petrol engines are used in light weight vehicles like car, motorcycles, scooters etc. Diesel engines are used in heavy vehicles like buses, trucks, locomotives etc.
9. Fuel consumption in petrol engine is higher than in the diesel engine.
10. Petrol engine is lighter whereas diesel engine is heavier.
11. Frequent overhauling is required in petrol engine but overhauling of diesel engine is done after a long time.
12. There is lesser starting problem in petrol engine as compared with diesel engine.
13. Petrol engine has lowered initial and maintenance cost but the initial and maintenance cost of diesel engine is high.

The ignition system

Система зажигания

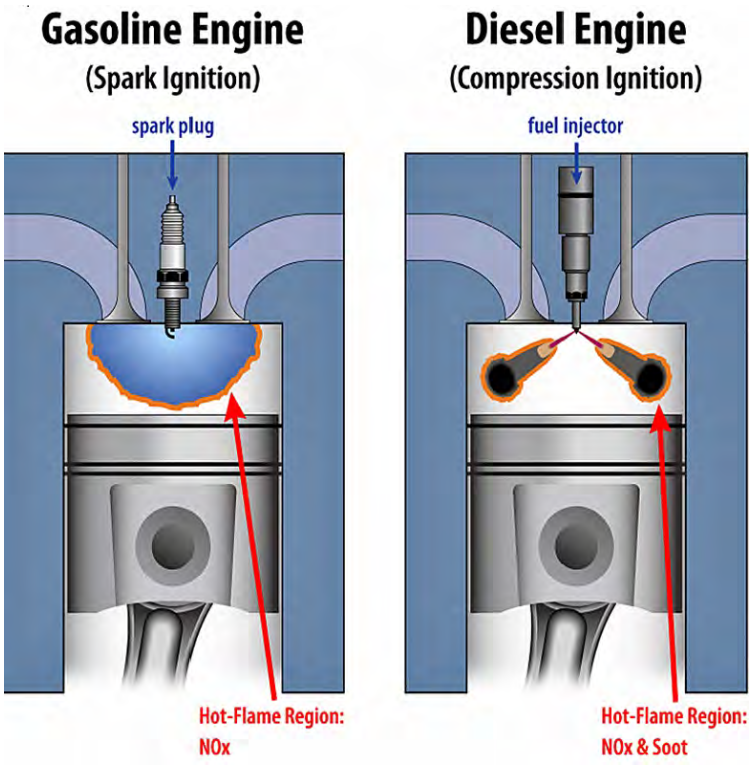
There are two general types of ignition: the compression and the spark methods.

Compression Ignition. The compression type utilizes the heat of compressed air to ignite the fuel as it is introduced to the combustion or precombustion chamber. The temperature of this air may be as high as 1000° F and sometimes may be higher. If fuel was mixed with the air before compression, preignition would occur; that is, the mixture would ignite before the piston was in the most favourable position to receive the thrust of the expanding gases. This would not be desirable.

Ignition is timed in the compression ignition engine by timing the injection of the fuel. In an engine operating at a constant speed, the need for variance of timing would not be present. The truck diesel engine, which must operate under a wide range of speed conditions, must have a

governor which can control the injection starting point and the injection period.

In a cold engine trouble is usually experienced in bringing the compression temperature up to the ignition temperature of the fuel. To assist the process, glow plugs are sometimes used. these are operated electrically and are turned off when fuel ignition begins.



Most diesel (compression ignition) engines utilize heavy-duty electrical starters by 12 volts or more from storage batteries or gasoline engines to turn the CI engine over fast enough to bring the temperature up to the ignition point.

When the CI engine has reached temperatures that ignite the fuel, no further trouble is experienced with ignition. There are no wires, coils, and plugs to cause trouble. Some diesel engines under light load or at idle may be cooled sufficiently to produce poor ignition of the fuel. This condition is overcome as more fuel is burned under operating conditions.

The other ignition system, the spark type, is the one which is more complicated and therefore it is the frequent cause of poor engine performance.

Spark ignition. The purpose of the spark ignition system is to deliver a perfectly timed surge of electricity across an open spark plug gap in each cylinder at the exact moment when it will explode the cylinder's charge of compressed gasoline and air with maximum power efficiency. The distinguishing feature of the SI (spark ignition) engine is that there is a spark plug in the engine head. The plug projects into the combustion chamber. In most modern SI engines the gap of the plug remains fixed while the engine operates.

Considering the source of electric current, there are two types of spark ignition. They are the battery ignition and the magneto ignition

types. With the battery, current is produced by chemical reactions within the battery; with the magneto, current is induced or created by rapidly moving coils or magnets.

Do you know these words?
(Знаете ли вы эти слова?)

to ignite	[ɪgˈnaɪt]	*зажигать, воспламенять*
spark	[spa:k]	*искра, вспышка*
to utilize	[ˈjutɪlaɪz]	*использовать*
to introduce	[ɪntrəˈdju:s]	*вносить*
combustion chamber	[kəmˈbʌstʃən ˈʧeɪmbə]	*камера сгорания*
to receive	[rɪˈsi:v]	*получать*
thrust	[θrʌst]	*толчок, сила тяги*
to time	[taɪm]	*регулировать*
injection	[ɪnˈʤekʃn]	*впрыск*
governor system	[ˈgʌvənə ˈsɪstəm]	*система регулировки*
trouble	[ˈtrʌbəl]	*трудность, проблема*
to bring out (brought, brought)	[brɪŋ aut]	*доводить*
to turn off	[tə:n of]	*отключать*
wire	[waɪə]	*провод*
coil	[coɪl]	*катушка, обмотка*
at idle	[ət aɪdl]	*на холостом ходу*
to overcome (overcame, overcome)	[ouvəˈkʌm]	преодолевать
gap	[gæp]	зазор
surge	[sə:dʒ]	ток высокого напряжения
to project	[proˈdʒəkt]	выдаваться, выступать
current	[ˈkʌrənt]	ток
to induce	[ɪnˈdju:s]	индуктировать

1. Answer these questions:
(Ответьте на эти вопросы):

1. What types of ignition do you know?
2. What does the compression type of ignition utilize?

3. When would preignition occur?
4. How is ignition timed in the compression ignition engine?
5. What device controls the injection starting point and the injection period?
6. What trouble is experienced in a cold engine?
7. What assists in bringing the compression temperature up to the ignition temperature of the fuel?
8. Why are heavy-duty electrical starters used in most CI engines?
9. When do diesel engines produce poor ignition of the fuel?
10. What is the purpose of the spark ignition system?
11. What is the distinguishing feature of the SI engine?
12. What are the two types of spark ignition?
13. How is current produced with the battery and with the magneto?

2. Define the part of speech of the following derivatives, try to guess their meaning, check their translation in a dictionary.

(Определите, какой частью речи являются следующие однокоренные слова, попытайтесь догадаться, как они переводятся на русский язык, проверьте перевод в словаре).

1. to compress – compression – compressor
2. to combust – combustion – precombustion – combustible
3. to ignite – ignition
4. electric – electricity – electrically - electrical

3. Match the synonyms from the columns.

(Соедините синонимы из колонок).

1. heavy-duty	a. problem
2. to time	b. difficult
3. trouble	c. to cause
4. to induce	d. to regulate
5. complicated	e. to use
6. performance	f. suitable
7. to distinguish	g. burning
8. to project	h. work
9. combustion	i. to differ
10. to utilize	j. durable
11. favourable	k. to stick out

4.Match the words with their definitions.

(Подберите к словам соответствующие определения).

1. to ignite	a. to stop working of something by means of a switch
2. spark	b. to run slowly without doing work
3. to turn off	c. a discharge serving to fire explosive mixture in an internal combustion engine
4. wire	d. movement of electrically charged particles
5. coil	e. to cause combustion in a n engine cylinder
6. to be idle	f. a piece of metal drawn out into the form of a thread or a slender flexible rod
7. gap	g. something wound circularly
8. current	h. unfilled space or interval

5. Fill in the blanks using the given words.

(Заполните пропуски, используя данные слова).

ignition	compressed	heavy-duty	distinguishing
desirable	performance	utilize	combustion
project	complicated	trouble	efficiency

1. We must consider how best to … the resources we have.
2. The ability to speak a foreign language is highly… .
3. I turned the … key and nothing happened.
4. Scuba divers used cylinders of … air.
5. The internal … engine created a new mobility, for people and goods alike.
6. The car's … on mountain roads was impressive.
7. The main … feature of this car is its body shape.
8. Four towers … from the main building.
9. If you have engine … , park as far to the side of the road as possible.
10. The brain is like a very powerful, very … computer.
11. A new furnace could give you increased … and more heat output.
12. … machines or equipment are designed to be used for very hard work.

6. Mark the sentences true (T) or false (F).

(Определите, верно или неверно утверждение).

1. The distinguishing feature of CI engine is that there is a spark plug in the engine head.
2. The spark ignition system is more complicated than compression ignition system.
3. In the compression ignition engine ignition is timed with the help of special coils.
4. Preignition means ignition before the piston reaches the most favourable position.
5. Glow plugs are used to bring the compression temperature up to the ignition temperature of the fuel.
6. There are no wires, coils and plugs in a spark ignition engine.
7. Fuel ignites at the temperature 100°C in the combustion chamber.
8. The spark plug projects into the combustion chamber.

7. Complete the sentences choosing the best alternative.
(Заполните пропуски в предложениях, выбрав наиболее подходящий вариант).

1. The truck diesel engine has … controlling the injection starting point and the injection period.
   a. *a spark plug*
   b. *a gap*
   c. *a governor*
2. … assists in bringing the compression temperature up to the ignition point.
   a. *glow plugs*
   b. *heavy-duty electrical starters*
   c. *gasoline engines*
3. The spark ignition system is … the compression ignition system.
   a. *as complicated as*
   b. *more complicated than*
   c. *simpler than*
4. The distinguishing feature of the spark ignition system is that ….
   a. *the plug projects into the combustion chamber*
   b. *the gap of the plug remains fixed while the engine operates*
   c. *there is a spark plug in the engine head*
5. There are two general types of … : the battery type and the magneto type.
   a. *spark ignition*
   b. *compression ignition*

c. preignition

8. Role play the dialogue.

(Разыграйте диалог по ролям).

In the morning

Mr. Brown: Hello! I have a car-check appointment for 9.30 am.

Mechanic: Please drive your car in. We'll have a look and diagnose all the problems there are.

Mr. Brown: I'm from Chicago and I need to get back by 4 pm. Is it possible to do it quickly?

Mechanic: We'll try, but it all depends on the source of damage. What's the problem that you want to have fixed?

Mr. Brown: I've had several cases when the accelerator let me down. I'd like to have it checked on the first place. Further on, it's the horn, something is wrong with it as well.

Mechanic: Any other complaints?

Mr. Brown: Yes, and check the temperature gauge, please.

Mechanic: Ok, it seems that we'll need at least a couple of hours to finish the diagnostics. There is a corner café in front of our car-service station. You could wait there.

Mr. Brown: Thanks, but I'm having a business meeting in 20 minutes. One of my colleagues should pick me up in a minute or so. I'll get back by midday. Is that all right?

Mechanic: Sounds good. We'll try to finish all the repair works by then.

For your self-study

(Задания для самостоятельной работы)

9. Translate the sentences into Russian paying attention to the words in italics.

(Переведите предложения на русский язык, обращая внимание на выделенные курсивом слова).

1. A program was set up to *utilize* solar energy for household use.
2. Phil left his key in the *ignition* again.
3. Behind the factory is a machine that *compresses* old cars into blocks of scrap metal.
4. The new jet engines will deliver more *thrust* at top speeds.
5. The engine *turned over* twice and then stopped.

6. He has a *projecting* tooth.
7. Snow and freezing temperatures caused *troubles* for many airports.
8. For small children, getting dressed is a *complicated* business.
9. *Heavy-duty* materials are strong and thick and not easily damaged.

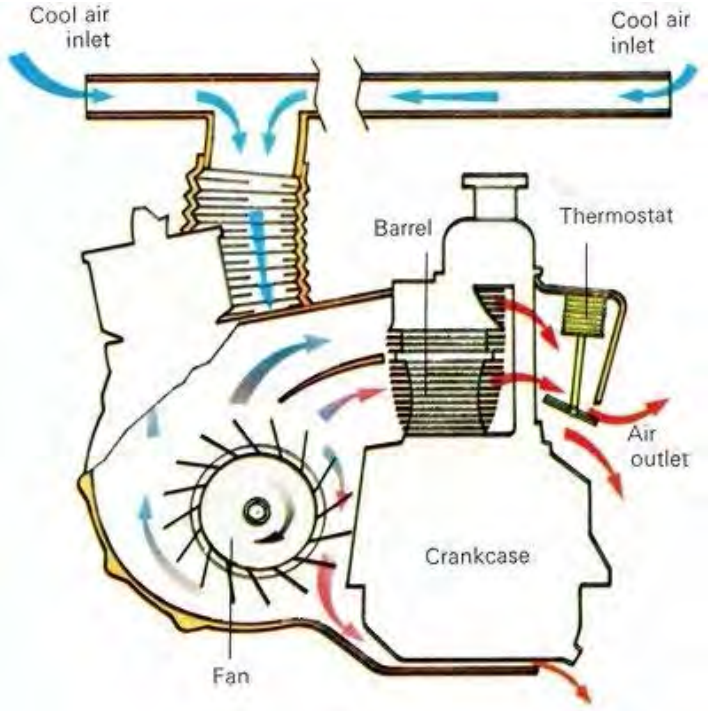
10. Find the English equivalents for the following word combinations in the text.

(Найдите в тексте английские эквиваленты следующих словосочетаний).

1. использовать тепло сжатого воздуха для воспламенения топлива
2. смешивать топливо с воздухом перед сжатием
3. находиться в наиболее благоприятном положении
4. получить толчок расширяющихся газов
5. регулирование впрыска топлива
6. работать с постоянной скоростью
7. широкий диапазон скоростных условий
8. контролировать начало впрыска
9. доводить температуру сжатия до температуры воспламенения топлива
10. работать от электричества
11. испытывать проблемы с зажиганием
12. частая причина плохой работы двигателя
13. доставлять четко отрегулированный ток высокого напряжения
14. отличительная черта
15. выдаваться в камеру сгорания
16. зазор свечи зажигания
17. источник электрического тока

Cooling systems

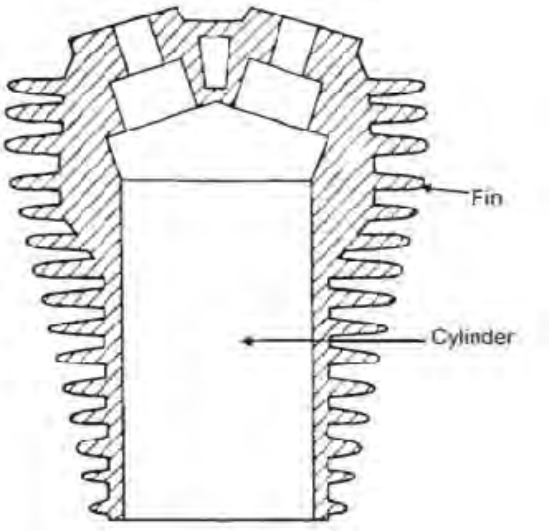
Системы охлаждения



The temperature produced in the cylinder of an engine at the instant the explosion takes place is very high. In other words there is an excess quantity of heat liberated that must be taken away rapidly. It is estimated that about one-third of this heat escapes through the cylinder wall. Consequently, the cylinder becomes hot, particularly at the head and around the exhaust valve, and some means of conducting away the heat is necessary.

All internal combustion engines must operate at a certain temperature to produce the best results. Therefore, cooling system that permits absorption of heat is important. The systems of cooling engines are commonly used: air cooling and water (liquid) cooling. Air cooling system is as reliable as liquid cooling one.

Air cooling. This method is used mainly for small single cylinder engines. The cooling effect is produced usually by means of fins or projections on the cylinder. These fins may be placed transversally or longitudinally with respect to the cylinder, depending upon the use of the engine and the direction of the air flout passing the cylinder. Such air arrangements as fins increase the radiating surface and therefore the heat escapes fast. The larger the radiating surface, the faster the heat escapes. An air-cooled engine has the following advantages:



1. It is light in weight.

2. It is simpler in construction.
3. It is more convenient and less troublesome.
4. There is no danger of freezing in cold weather.

The principle disadvantage of air cooling is that it is difficult to maintain proper cooling under all conditions and it is almost impossible to control the cylinder temperature.

Air-cooled engines usually run a little hotter than water-cooled engines and require the use of heavier lubricating oil. Air cooling system is more simple than the forced circulation one.

Do you know these words?

(Знаете ли вы эти слова?)

certain	[sə:tn]	*определённый*
common	[ˈkomən]	*обыкновенный*
consequently	[ˈkonsıkwəntlı]	*следовательно*
convenient	[kənˈvi:nıənt]	*удобный*
danger	[ˈdeındʒə]	*опасность*
to depend upon	[dıˈpendə´pon]	*зависеть от*
to estimate	[ˈestımeıt]	*оценивать*
forced circulation	[fo:st sɜ:kjʊˈleıʃn]	*принудительная циркуляция*
freezing	[ˈfri:ziŋ]	*замерзание*
to flow (flew, flown)	[fləʊ]	*течь*
instant	[ˈınstənt]	*момент*
to liberate	[ˈlıbəreıt]	*освобождать*
liquid	[ˈlıkwıd]	*жидкость*
longitudinally	[londʒɪˈtju:dınəlı]	*продольно*
mainly	[ˈmeınlı]	*главным образом*
means	[mi:nz]	*способ, средство*
necessary	[ˈnesəsrı]	*необходимый*
to permit	[pəːˈmıt]	*позволять, давать возможность*
particularly	[pəˈtıkjuləlı]	*особенно*
proper	[ˈpropə]	*правильный*
quantity	[ˈkwo:ntətı]	*количество*
rapidly	[ˈræpıdlı]	*быстро*
to radiate	[ˈreıdıət]	*излучать, отражать*
reliable	[rıˈlaıəbl]	*надёжный*

respect	[rɪˈspekt]	*отношение*
single	[ˈsɪŋgl]	*единственный*
thawing	[ˈθo: ɪŋ]	*таяние*
therefore	[ˈðeəfo:]	*следовательно, поэтому*
transversely	[trænsˈvə:səlɪ]	*поперечно*

1. Answer these questions:

(Ответьте на эти вопросы):

1. What part of heat escapes through the cylinder wall?
2. Why is there a need for cooling systems?
3. What types of cooling systems are mainly used?
4. What is more reliable: air cooling system or water cooling one?
5. What is used to increase the radiating surface?
6. How are the fins placed on the cylinder?
7. What does the arrangement of the fins depend on?
8. What are the advantages of an air-cooled engine?
9. What is the principle disadvantage of air cooling?

2. Form adverbs using the given adjectives, translate them into Russian.

(Образуйте наречия от данных прилагательных, переведите их на русский язык).

Model: *quick* + ***ly*** → *quickly*

certain - …
simple - …
usual - …
main - …
common - …
transversal - …
longitudinal - …
proper - …
particular - …
instant - …

3. Translate the words having negative prefixes, write their antonyms without prefixes.

(Переведите слова с отрицательными приставками, запишите их антонимы без приставок).

Irregular, incorrect, disadvantage, unusual, non-effective, unknown, deformation, improper, inconvenient, uncommon, unnecessary, unreliable, disrespect, disconnect, disengage.

4.Match the antonyms from the columns.

(Соедините антонимы из колонок).

1.	advantage	a.	worst
2.	fast	b.	disadvantage
3.	convenient	c.	cold
4.	permit	d.	transversely
5.	hot	e.	complex
6.	longitudinally	f.	troublesome
7.	common	g.	prevent
8.	simple	h.	inlet
9.	best	i.	rare
10.	exhaust	j.	slow

5. Match the words with their definitions.

(Подберите к словам соответствующие определения).

1.	projection	a. to allow electricity or heat to travel along or through something
2.	circulation	b. a group of things that are put in a particular position
3.	to escape	c. something that sticks out from a surface
4.	convenient	d. useful to you because it saves you time, or does not spoil your plans or cause you problems
5.	freezing	e. condition when the liquid inside a machine, engine or pipe becomes solid with cold, so that it does not work properly
6.	to conduct	f. the movement of liquid, air etc in a system
7.	transversely	g. to get out
8.	longitudinally	h. a projection on devices to improve heat transfer
9.	arrangement	i. to emit rays of light, heat, or other electromagnetic waves
10.	fin	j. crosswise
11.	to radiate	k. lengthwise

6. Translate the sentences into Russian, define the part of speech of the words in italics.

(Переведите предложения на русский язык, определите часть речи выделенных курсивом слов).

1. This research *project* is devoted to new sources of energy.
2. His smile was spoiled by *projecting* teeth.

3. This light *means* you're running low on fuel.
4. For most people the car is still their main *means* of transport.
5. A standard washing machine *uses* about 40 gallons of water.
6. Robots have many different *uses* in modern industry.
7. Always keep your passport in a safe *place*.
8. The turbine is basically a jet engine with a fan *placed* in the exhaust.
9. He commands (=has and deserves) the *respect* of everyone in the profession.
10. I would like you to *respect* my privacy.
11. You need to put some *air* in the tyres.
12. I've left my sweater outside to *air*.
13. Black surfaces absorb *heat* from the sun more than white ones.
14. The stove takes a while to *heat* up.
15. Students are encouraged to take *control* of their own learning, rather than just depending on the teacher.
16. A thermostat *controls* the temperature in the building.

7. Translate the sentences with the construction 'the … , the …'.
(Переведите предложениясо сравнительным оборотом «чем… , тем … »).
1. The lower the temperature, the faster the water is cooled.
2. The more we control the temperature of the water in a water jacket, the better an engine runs.
3. The larger the radiating surface, the faster the heat escapes.
4. The more I thought about it, the less I liked the idea.

8. Mark the sentences true (T) or false (F).
(Определите, верно или неверно утверждение).
1. It was found out that about a quarter of heat escapes through the cylinder wall.
2. The cylinder temperature doesn't affect the engine's work.
3. There are two types of cooling systems.
4. Fins are the arrangements used to increase the radiating surface.
5. Water-cooled engines are usually hotter than air-cooled ones.
6. Air cooling system is more reliable than liquid cooling one.
7. Fins or projections on the cylinder allow to produce a greater cooling effect.
8. An air-cooled engine has a more complex design than a water-cooled one.

9. Find the English equivalents for the following word combinations in the text.

(Найдите в тексте английские эквиваленты следующих словосочетаний).

1. *средства для отведения тепла*
2. *рёбра или выступы на цилиндре*
3. *располагаться поперечно или продольно по отношению к цилиндру*
4. *главный недостаток воздушного охлаждения*
5. *требовать использования более тяжелого масла для смазки*
6. *система принудительной циркуляции*
7. *избыточное количество освобождаемого тепла*
8. *поглощение тепла*
9. *увеличивать отражающую поверхность*
10. *поддерживать надлежащее охлаждение*
11. *контролировать температуру цилиндра*
12. *зависеть от направления воздушного потока, проходящего через цилиндр*

10. Role play the dialogue.

(Разыграйте диалог по ролям).

At 12 pm

Mechanic: Oh, you are back. Mr. Brown, your car problems are solved. More than that we've changed one flat tyre and the brake light which didn't work.

Mr. Brown: Is the problem with the accelerator solved?

Mechanic: Yes, but partially. We've fixed the major issues, but you might need to have the engine checked. Will you be visiting our city sometimes in the near future?

Mr. Brown: Next week I have a conference here. I can leave the car for five hours or even more. After the conference I'm having dinner with friends. So, you'll have enough time to diagnose and fix the engine. If you need any spare parts, I'll buy them on the way. By the way, did you check the battery?

Mechanic: Yes, everything is in order with it. It looks top new.

Mr. Brown: It should be. I bought it three months ago. How much do I owe you for today's work?

Mechanic:150 dollars, sir. Along with that you get a 30-day warranty

card.

I wonder what is it for?

Mechanic: If during one month there is a breakage connected with the work we did, we are going to fix your car for free. That's how the warranty card works.

Mr. Brown: Great! Thank you for all your hard work. See you next week.

Mechanic: Oh, Mr. Brown, I forgot to warn you. The oil level in the car is below the full mark. There is a gas station in the downtown. It's a five-minute drive from here. So, make sure you stop there, otherwise, you won't make it to Chicago.

Mr. Brown: I totally forgot about that. Thanks for reminding. I'll drive through the station then.

For your self-study

(Задания для самостоятельной работы)

11. Fill in the blanks using the given words.

(Заполните пропуски, используя данные слова).

absorption simpler danger water
escapes single lubricating
air exhaust reliable radiating

1. There are two systems of cooling engines: … cooling and … cooling.
2. An air-cooled engine is … in construction than a water cooled one.
3. Cooling system permits the … of heat.
4. Air-cooled engines require the use of heavier … oil.
5. Fins on the cylinder increase the … surface.
6. About one-third of heat … through the cylinder wall.
7. The cylinder becomes hot, particularly at the head and around the … valve.
8. Air cooling is used for small … cylinder engines.
9. One of the advantages of an air-cooled engine is that there is no … of freezing in cold weather.
10. Air cooling system is as …as liquid cooling one.

12.Complete the sentences choosing the best alternative.

(Заполните пропуски в предложениях, выбрав наиболее подходящий вариант).

1. It is estimated that about … of the heat liberated at the instant the explosion takes place escapes through the cylinder wall.
   a. *a half*
   b. *three quarters*
   c. *one-third*
2. Air cooling system is … liquid cooling one.
   a. *more reliable than*
   b. *less reliable than*
   c. *as reliable as*
3. In the … cooling system the cooling effect is achieved by means of fins or projections on the cylinder.
   a. *air*
   b. *liquid*
   c. *water*
4. Transversal or longitudinal placement of the fins depends upon ….
   a. *the use of the engine*
   b. *the direction of the air flout passing the cylinder*
   c. *the engine design*
5. … is one of the advantages of an air-cooled engine.
   a. *low weight*
   b. *simple design*
   c. *danger of freezing in cold weather*

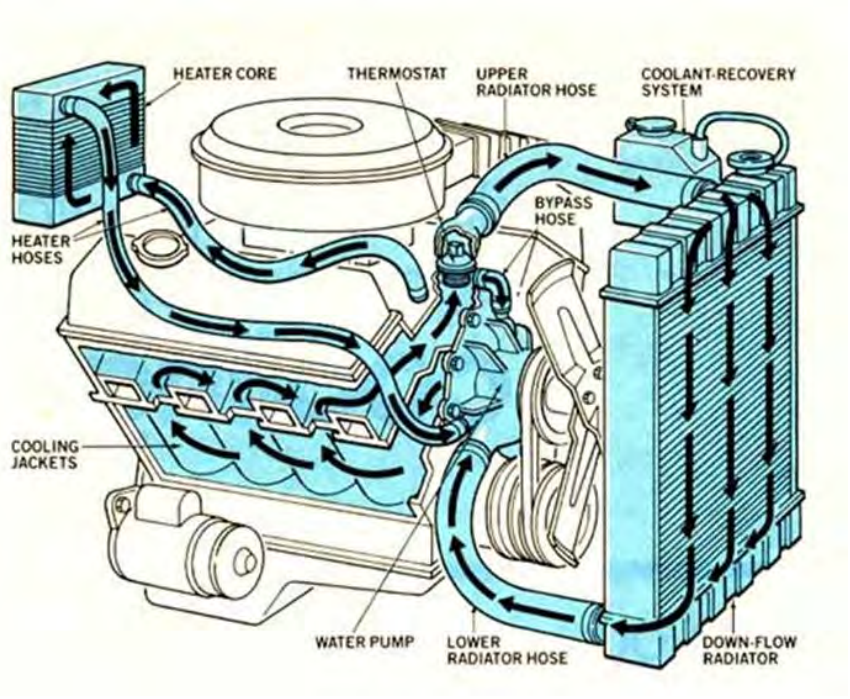
Water cooling

Водяное охлаждение

Cooling systems using liquids usually water are used for all types of engines from the simplest stationary farm engine to the most complicated multi-cylinder high speed types.

Thermosiphon System. The thermosiphon system of liquid cooling includes in addition to the water jacket about the cylinder a separate tank or reservoir connected at the top and bottom by a pipe leading to the upper and lower parts of the cylinder. In tractors this tank or reservoir is replaced by the radiator. This tank is made up from many fine passages through which the water flows and cools rapidly. The more the passages, the cooler the tank.

Forced-circulation System. The forced-circulation system resembles the thermosiphon system with the exception of a pump which is placed in the lower pipe leading to the cylinder. This pump, usually of the centrifugal type forces the water through the cylinder jacket and around the reservoir. The advantage of this system is that since the water is circulated more rapidly it is cooled faster and less liquid is required to produce the same cooling effect.



The principal objections to the forced-circulation cooling system are the greater number of connections and the occasional leaking of the pump.

The forced-circulation system is more simple and convenient than the thermosiphon one.

Do you know these words?

(Знаете ли вы эти слова?)

liquid [ˈlɪkwɪd] *жидкость, жидкий*

stationary	[ˈsteɪʃənərɪ]	*неподвижный, стационарный*
complicated	[ˈkomplɪkeɪtɪd]	*сложный*
thermosiphon	[θɜːməʊˈsaɪfən]	*термосифон, система охлаждения с естественной циркуляцией охлаждающего агента*
water jacket	[ˈwoːtəˈʤækɪt]	*водяная рубашка, кожух водяного охлаждения*
tank	[tæŋk]	*бак, резервуар*
reservoir	[ˈrezəːwvaː]	
pipe	[paɪp]	*труба*
fine	[faɪn]	*тонкий*
passage	[ˈpæsɪʤ]	*проход, канал*
exception	[ɪkˈsepʃn]	*исключение*
centrifugal	[sentrɪˈfjuːgəl]	*центробежный*
to force	[foːs]	*заставлять*
to require	[rɪˈkwaɪə]	*требовать*
objection	[əbˈʤekʃn]	*возражение*
occasional	[əˈkeɪʒənəl]	*случающийся время от времени*
leaking	[ˈliːkɪŋ]	*протечка, течь*

1. Answer these questions:

(Ответьте на эти вопросы):

1. Where are liquid cooling systems used?
2. How is the tank connected to the cylinder?
3. What is radiator?
4. What is the difference between the forced-circulation system and the thermosiphon one?
5. What is the function of the pump?
6. What is the advantage of the forced-circulation system?
7. What are the principle objections to the forced-circulation system?
8. Which of the liquid cooling systems better?

2. Form the comparative and superlative degrees of the given adjectives and adverbs, translate them into Russian.

(Образуйте сравнительную и превосходную формы степеней сравнения данных прилагательных и наречий, переведите их на русский язык).

Model: *small – smaller – the smallest*
common – more common – the most common
simple, complicated, low, many, cool, fast, little, great, convenient

3. Translate the international words.
(Переведите интернациональные слова).
Jacket, vibration, thermosiphon, tank, lead, centrifugal type, mixture, sort, circulate.

4. Find the odd word in each row.
(Найдите лишнее слово в каждом ряду).
1. to flow, to move, to cool, to pass, to circulate;
2. pump, jacket, pipe, reservoir, speed;
3. fine, cool, simple, rapidly, convenient;
4. more rapidly, the simplest, faster, greater, lower;
5. jacket, passage, engine, centrifugal, advantage;
6. made, pipe, pump, same, place.

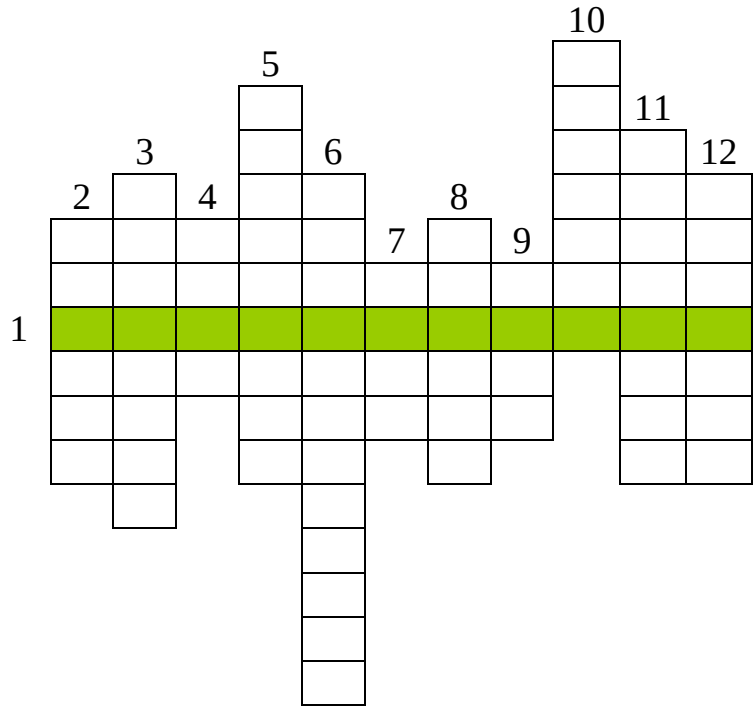
5.Match the words from the columns to make word combinations from the text.
(*Соедините слова из колонок, чтобы образовать словосочетания из текста).*

1. connected	a. leaking
2. the lower	b. by a pipe
3. the simplest	c. stationary farm engine
4. cylinder	d. part of the cylinder
5. cooling	e. to the cylinder
6. high speed	f. effect
7. leading	g. jacket
8. greater	h. engine
9. occasional	i. number of connections

6. Translate the sentences with the word 'one'.
(*Переведите предложения со словом "one").*
1. This tractor is better than that one.
2. Cooling system is one of the most essential systems of an engine.
3. Cooling systems are used for all types of engines from the simplest stationary farm engine to the most complicated multiple-cylinder high speed ones.

4. There are many anti-freeze chemicals but this one is the most common.

7. Guess the crossword puzzle.
(Разгадайте кроссворд).



1. moving or tending to move from the centre
2. outer covering for maintaining desired temperature
3. part of the machine holding fluid
4. a large vessel for liquid or gas
5. quality or fact against something
6. a system in which a coolant is circulated by convection caused by a difference in density between the hot and cold portions of the liquid
7. a tube for conveying liquid or gas
8. result, consequence
9. machine, usually cylinder in which piston is moved up and down by rod for raising water
10. passage of the fluid through a hole caused by injury or wear
11. an apparatus having a large surface for cooling circulating water
12. a system for keeping the temperature in an engine low

8. Find the English equivalents for the following word combinations in the text.
(Найдите в тексте английские эквиваленты следующих словосочетаний).

1. *множество тонких проходов*
2. *наиболее сложный многоцилиндровый тип*
3. *термосифонная система*

4. *основное возражение*
5. *заменить на радиатор*
6. *отдельный бак*
7. *ведущий к цилиндру*
8. *за исключением насоса*
9. *производить одинаковый охлаждающий эффект*
10. *центробежный тип*
11. *через рубашку цилиндра*
12. *большее количество соединений*
13. *протекание насоса*

9. Match the antonyms from the columns.

(Соедините антонимы из колонок).

1.	to cool	a.	low
2.	the simplest	b.	the most complicated
3.	high	c.	regular
4.	separate	d.	less
5.	more	e.	connected
6.	advantage	f.	movable
7.	slowly	g.	disadvantage
8.	occasional	h.	rapidly
9.	stationary	i.	to heat

For your self-study

(Задания для самостоятельной работы)

10.Mark the sentences true (T) or false (F).

(Определите, верно или неверно утверждение).

1. The temperature of the tank in the thermosiphon system depends on the number of passages in it.
2. The thermosiphon system of liquid cooling doesn’t use a pump.
3. Cooling takes much less time in the thermosiphon system than in the forced-circulation one.
4. There are two systems of liquid cooling.
5. Radiator is an essential part of any system of liquid cooling.
6. In the thermosiphon system the pump is situated in the upper pipe leading to the cylinder.
7. Liquid cooling is used only for the simplest stationary farm engines.
8. Water jacket is placed around the cylinder.

9. One of the disadvantages of the forced-circulation system is the occasional leaking of the pump.
10. The centrifugal pump is very common in the forced-circulation system of liquid cooling.

11. Fill in the blanks using the given words.
(Заполните пропуски, используя данные слова).

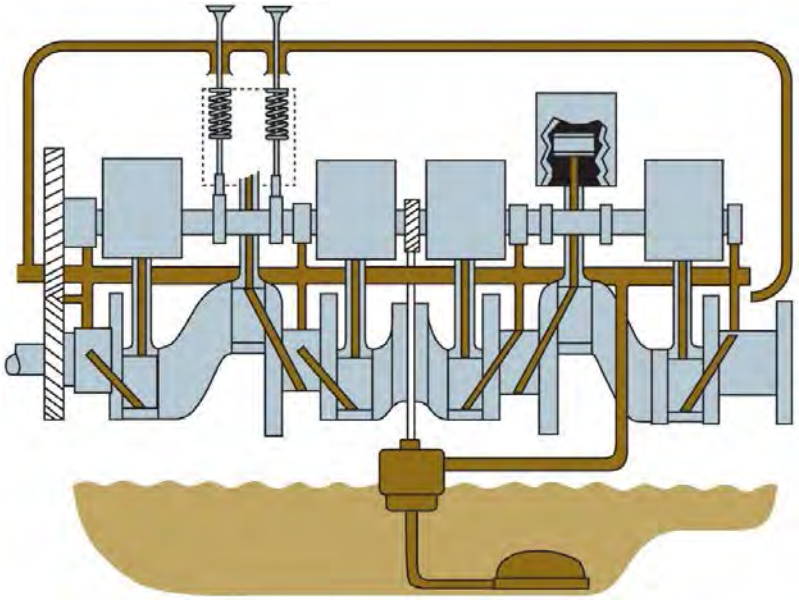
connection	radiator	cooling
centrifugal	pipe	tank
leaking	objections	

1. There are two major … to this argument
2. A … had burst in the kitchen and flooded the floor.
3. They're offering free Internet … .
4. The … force is not influenced by temperature.
5. I think the fuel … is leaking.
6. Water was … from a pipe in the bathroom.
7. The processor is very complex and it needs to be connected to the power supply and chilled by water … system.
8. Passing this liquid through pipes in the … allowed it to radiate energy into the cold space.

Lubrication system

Система смазки

If two surfaces are rubbed together they will get hot and this heat is caused by friction. Different lubricants used in the tractor perform essential functions:



1. Conduct away excessive heat.
2. Reduce friction and wear between moving parts.
3. Seal compression between pistons and cylinder walls.

4. Cushion on the loads on bearings of the power transmitting system.

Because tractor work is so severe – long hours, heavy loads, dusty fields, rough ground, steep hills, all kind of weather – we have to be very careful about lubrication. The petroleum industry has developed excellent oils and greases. Manuals tell what kind and grades to use and where and how often to apply them. The lubrication system holds and circulates an ample supply.

The job in properly lubricating a tractor can be summarized as follows:

1. Selecting the kinds of lubricants recommended by the manufacturer.
2. Applying these in correct amounts at recommended intervals.
3. Maintaining proper quantities within the tractor.
4. Changing lubricants as required.
5. Keeping these lubricants clean and free from contamination and dilution.

Three methods of lubricating engines are commonly used: splash lubrication, force-feed lubrication and petrol lubrication.

The first is more used in small single-cylinder air cooled engines. Force-feed lubrication is preferred in all modern diesel and petrol engines. The last method, petrol lubrication is common to small two-stroke engines and consists in mixing a small quantity of oil with petrol.

A splash system of lubrication is quite simple and reliable. Lubrication is achieved by oil splash and in order that this splashing may take place a “dipper” is provided on the end of the big end cap. When the engine is running, this dipper dips into a narrow trough of oil positioned directly beneath it and throws or splashes oil to the working parts. The big end, little end of the cylinder, crankshaft bearings, camshaft, and timing gear are lubricated by splash or spray.

Do you know these words?

(Знаете ли вы эти слова?)

to rub	[rʌb]	*тереть*
friction	[frɪkʃn]	*трение*
lubricant	[ˈlu:brɪkənt]	*смазка, смазочное средство*
to perform	[pəˈfo:m]	*выполнять*

excessive	[ɪkˈsesɪv]	*чрезмерный, излишний*
wear	[wɛə]	*износ*
to cushion	[kʊʃn]	*смягчать, уменьшать*
rough	[rʌf]	*неровный, ухабистый*
steep	[sti:p]	*крутой*
careful	[ˈkɛəfəl]	*внимательный*
grease	[gri:s]	*густая смазка*
manual	[ˈmænjuəl]	*руководство, инструкция по применению*
toapply	[əˈplaɪ]	*применять*
ample	[ˈæmpl]	*достаточный, обильный*
contamination	[kəntæmɪˈneɪʃn]	*загрязнение*
dilution	[daɪˈlu:ʃn]	*разбавление, разжижение*
splash lubrication	[splæʃˈlu:brɪˈkeɪʃn]	*смазка разбрызгиванием*
force-feed lubrication	[ˈfo:s fi:d luːbrɪˈkeɪʃn]	*принудительная смазка*
petrol lubrication	[ˈpetrəl luːbrɪˈkeɪʃn]	*топливная смазка*
dipper	[ˈdɪpə]	*черпачок шатуна*
to dip	[dɪp]	*погружать*
trough	[trof]	*жёлоб, кюветка*
beneath	[bɪˈni:θ]	*внизу, под*
to through (threw, thrown)	[θrəu]	*бросать*
big end cap	[bɪg end kæp]	*крышка шатуна*

1. Answer these questions:

(Ответьте на эти вопросы):

1. Why is it necessary to use lubricants?
2. Why should special attention be paid to lubricating tractors?
3. What two types of lubricants are there? What is the difference between them?
4. What are the general rules of applying lubricants?
5. What are the methods of lubricating engines?
6. Which method is used in small single-cylinder air cooled engines?
7. In what kind of engines is force-feed lubrication preferred?
8. How is petrol lubrication performed?

9. What helps provide splashing in the splash system of lubrication?
10. What working parts of the engine are lubricated by splash or spray?

2. Match the antonyms from the columns.

(Соедините антонимы из колонок).

1. clean	a. poor
2. different	b. careless
3. simple	c. outdated
4. careful	d. complicated
5. modern	e. wide
6. excellent	f. similar
7. narrow	g. contaminated

3.Fill in the blanks using the given words.

(Заполните пропуски, используя данные слова).

careful	reliable	common
lubricate	wear	friction
surfaces	lubrication	trough

1. Putting oil on both … reduces friction.
2. Proper … minimizes engine wear.
3. You'll be ok with Jane – she is a very … driver.
4. Excessive tyre… may be caused by faulty brakes.
5. Splash system of lubrication is quite simple and … .
6. I recommend to … all moving parts with grease.
7. Heat can be produced by chemical reactions or … .
8. Petrol lubrication is … to small two-stroke engines.
9. When the engine is running, the dipper dips into a narrow … of oil.

4. Match the words from the columns to make word combinations from the text.

(*Соедините слова из колонок, чтобы образовать словосочетания из текста).*

1. to conduct away	a. essential functions
2. to apply	b. the heat
3. to perform	c. friction
4. to reduce	d. excellent oils and greases
5. to develop	e. lubricants

5.Find the English equivalents for the following word combinations in the text.

(Найдите в тексте английские эквиваленты следующих словосочетаний).

1. *обильный запас*
2. *достаточно простой и надёжный*
3. *пыльные поля*
4. *неровная почва*
5. *снижать нагрузку на подшипники*
6. *быть обусловленным трением*
7. *отводить излишнее тепло*
8. *погружать в узкий жёлоб с маслом*
9. *распределительная шестерня*
10. *поддерживать надлежащее количество*
11. *по мере необходимости*
12. *разрабатывать отличные жидкие и густые смазочные материалы*

6. Find in the word box the words corresponding to the following definitions. The words are placed horizontally, vertically, and diagonally.

(Найдите в сетке слова, соответствующие следующим определениям. Слова расположены горизонтально, вертикально и диагонально).

c	a	m	b	e	n	a	g	d	u	s	t	y
l	o	a	d	i	p	p	e	r	i	h	r	b
d	c	n	k	l	f	w	g	o	y	t	o	p
m	a	u	t	h	z	f	e	x	n	d	u	c
s	r	a	j	a	g	r	e	a	s	e	g	j
u	e	l	v	i	m	w	c	e	r	e	n	r
d	f	r	i	c	t	i	o	n	p	n	q	u
t	u	g	l	n	r	m	n	o	v	g	x	a
r	l	l	u	b	r	i	c	a	t	i	o	n
o	t	s	u	r	f	a	c	e	t	n	s	z
s	p	l	a	s	h	k	t	y	c	e	b	w

1. The natural force that prevents one surface from sliding easily over another surface.
2. A substance such as oil that you put on surfaces that rub together, especially parts of a machine, in order to make them move smoothly and easily.
3. To put a lubricant on something in order to make it move more smoothly.
4. Damage caused by continuous use over a long period.

5. Paying a lot of attention to details, so that something is done correctly and thoroughly.
6. A thick oily substance that is put on the moving parts of a car, machine etc. to make it run or move smoothly.
7. A book that gives instructions about how to do something, especially how to use a machine.
8. To make a substance dirty or harmful by putting something in it.
9. The outside of a material body.
10. Something that is carried, burden.
11. To through small drops of liquid.
12. A thing used for splashing oil to the working parts of the machine.
13. A channel for conveying liquid.
14. Full of finely powdered dust.
15. A machine consisting of several parts working together and used as a source of power.

7. Mark the sentences true (T) or false (F).
(Определите, верно или неверно утверждение).
1. One of the functions of lubrication is to reduce friction and wear between moving parts.
2. There are two methods of lubricating engines: splash lubrication and force-feed lubrication.
3. Splash lubrication is quite simple and reliable and is used in all modern diesel and petrol engines.
4. Petrol lubrication consists in mixing a small quantity of oil with petrol.
5. There are special manuals telling what kind and grades of lubricants to use.
6. It is important to maintain proper quantities of lubricants within the tractor.

For your self-study

(Задания для самостоятельной работы)

8. Complete the sentences choosing the best alternative.
(Заполните пропуски в предложениях, выбрав наиболее подходящий вариант).
1. Petrol lubrication is mostly used in….
   a. modern diesel and petrol engines

b. small two-stroke engines
c. small single-cylinder air-cooled engines

2. Petrol lubrication consists in ….
a. splashing the oil to the working parts
b. mixing a small quantity of oil with petrol
c. maintaining proper quantities of lubricants within the tractor

3. … causes wear between moving parts.
a. contamination
b. friction
c. dilution

4. To lubricate the big end, little end of the cylinder, crankshaft bearings, camshaft and timing gear … lubrication is used.
a. petrol
b. force-feed
c. splash

5. One of the functions of lubrication is to seal … between pistons and cylinder walls.
a. compression
b. contamination
c. cushion

9. Translate the sentences into Russian.

(Переведите предложения на русский язык).

Note: *Глагол-связка «to be» перед инфинитивом при подлежащем, выраженном словами* ***task, problem, function, purpose*** *и т.п. либо совсем не переводится на русский язык, либо переводится словами «заключаться в том, что(бы)», «состоять в том, чтобы».*

1. The task of the radiator is to dissipate heat from the water to the air.
2. The main function of lubrication is to reduce friction and wear between the moving parts.
3. The aim of all designers of tractor engines has been to increase reliability.
4. Our first task is to gather information.
5. The purpose of the experiment is to find better ways of lubrication.
6. One of the purposes of applying lubricants is to cushion on the loads on bearings of the power-transmitting system.

The transmission system of a farm tractor

Трансмиссионная система сельскохозяйственного трактора

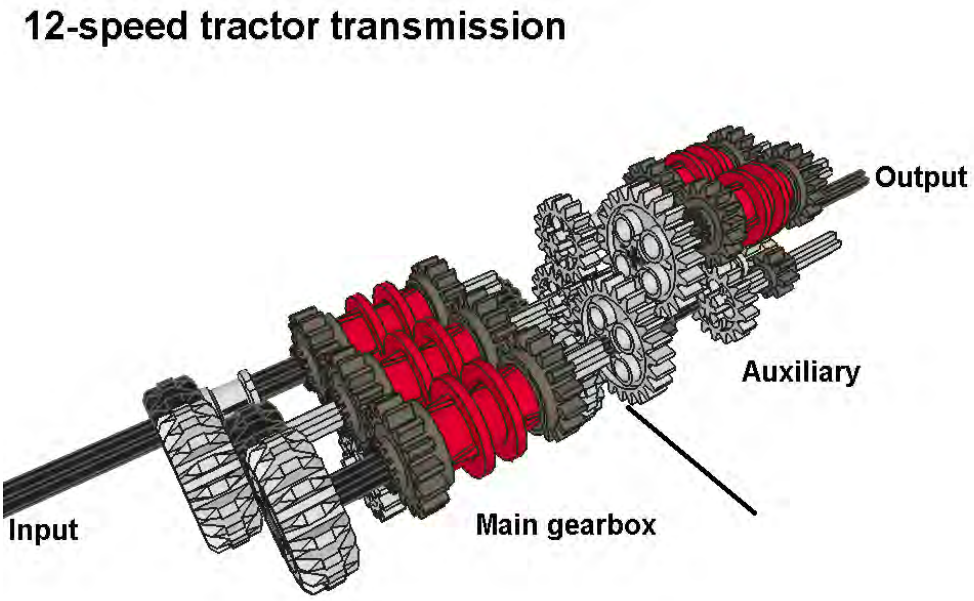
The transmission is a system of gears so constructed that the mechanical advantage of the engine may be changed with relation to the work to be done and so that direction of movement may be changed.

Tractors usually have three or more forward gears as well as a reverse gear in the transmission.

These various gears usually allow speeds from about 2-6 miles per hour for field work. If the tractor is built for rubber tires, it may have one or more additional forward gears for road use and it may be able to travel 15 to 20 or more miles per hour.

The transmission system consists of clutch, gearbox, differential, final drive and power take off (PTO) shaft.

Clutch. The first function of the transmission is carried out by a



clutch. This consists usually of one or two plates. Some tractors have multi-plate clutches in which a number of plates are alternately fixed to the flywheel and the gearbox input shaft. The clutch transmits the engine torque and provides the means of temporarily engaging or disengaging the drive from the engine to the transmission system that is to the gearbox.

The function of the gearbox is to provide a number of different ratios between the engine crankshaft speed and the tractor wheel speed. The larger the tractor, the greater the need for a large number of gear ratios in order that the available engine power may be efficiently utilized.

The drive in a wheel tractor is taken from the gearbox output by

means of a shaft to a differential unit in the centre of the rear axle. On the ends of the rear axle there are the tractor driving wheels and the purpose of the differential is to permit one to rotate faster than the other. The differential is included in the transmission system to allow the tractor to turn and it also permits one wheel to slip more than the other.

There are gears that connect the drive shaft and the lay shaft in the gearbox. They are designed to effect primary reduction. These two pairs of gears in the final drive increase the torque of the engine and transmit the power to the wheels.

The higher the torque, the larger the gears and shafts should be.

The power take off shaft is at the rear of the tractor. In many cases connection can be made to it for power to drive machines, such as combines, binders and other tools. The power take off shaft is behind the clutch and can be operated with the tractor standing or in the motion. The speed of the power take off shaft should be independent of the forward speed of the tractor and controlled only by engine speed.

Do you know these words?

(Знаете ли вы эти слова?)

gear	[gɪə]	*шестерня, передача*
advantage	[ədˈvɑːntɪʤ]	*преимущество*
reverse gear	[rɪˈvəːsgɪə]	*шестерня заднего хода*
tire	[ˈtaɪə]	*шина*
to travel	[ˈtrævəl]	*передвигаться*
clutch	[klʌʧ]	*муфта сцепления*
gearbox	[ˈgɪəboks]	*коробка передач*
drive	[draɪv]	*передача, привод, приводной механизм*
final drive	[ˈfaɪnl draɪv]	*конечная передача*
plate	[pleɪt]	*диск*
alternately	[oːlˈtəːnətlɪ]	*поочерёдно*
flywheel	[ˈflaɪwiːl]	*маховик*
torque	[toːk]	*крутящий момент*
temporarily	[ˈtempərərəlɪ]	*временно*
to engage	[ɪnˈgeɪʤ]	*сцеплять, включать*
to disengage	[ˌdɪsɪnˈgeɪʤ]	*расцеплять, выключать*
ratio	[ˈreɪʃɪəu]	*передаточное отношение*
crankshaft	[ˈkræŋkʃaːft]	*коленчатый вал*
to utilize	[ˈjuːtɪlaɪz]	*использовать*

gearbox output	[ˈgɪəboks ˈautput]	*вторичный вал коробки передач*
gearbox input shaft	[ˈgɪəboksˈɪnput ʃɑːft]	*первичный вал коробки передач*
axle	[ˈæksl]	*ось*
to slip	[slɪp]	*скользить, буксовать*
lay shaft	[ˈleɪ ʃɑːft]	*промежуточный вал*
drive shaft	[draɪvʃɑːft]	*ведущий вал*
power take off (PTO) shaft	[ˈpauə teɪk of ʃɑːft]	*вал отбора мощности*
binder	[ˈbaɪndə]	*сноповязалка*
reduction	[rɪˈdʌkʃən]	*понижение*
available	[əˈveɪləbl]	*доступный, имеющийся*

1. Answer these questions:

(Ответьте на эти вопросы):

1. What is transmission?
2. How many gears do tractors usually have in the transmission?
3. What allows to change the speed of the tractor?
4. What does the transmission system consist of?
5. What are the functions of the clutch?
6. What can you say about gearbox?
7. What part of the transmission system allows the tractor to turn?
8. Does the final drive increase the torque of the engine?
9. What determines the size of gears and shafts?
10. Where is the PTO shaft used?

2. Form nouns having the suffix -<u>ion</u> using the given verbs.

(Образуйте существительные с суффиксом -<u>ion</u>, используя данные глаголы).

Model: to direct → direct*<u>ion</u>*

To transmit, to construct, to permit, to connect, to reduce, to operate.

3. Match the antonyms from the columns.

(Соедините антонимы из колонок).

1.	to engage	a.	independent
2.	primary	b.	to disengage
3.	behind	c.	constantly
4.	dependent	d.	front

5.	forward	e.	secondary
6.	input	f.	to decrease
7.	temporarily	g.	lower
8.	different	h.	reverse
9.	rear	i.	output
10.	to increase	j.	in front of
11.	higher	k.	similar

4. Fill in the blanks using the given words.

(Заполните пропуски, используя данные слова).

clutch	reverse	transmission
ratios	means	transmitted

1. The transmission provides a … of varying the gear ratios of the engine crankshaft and the wheels.
2. Due to the … the engine crankshaft may turn four, eight, or twelve times for each wheel revolution.
3. A … gear permits backing the car.
4. The power that the engine develops must be … to the car wheels, so that the wheels will rotate and cause the car to move.
5. The clutch permits operation of the transmission so that the various gear … between the engine crankshaft and wheels may be obtained.
6. The … permits the driver to connect the crankshaft or to disconnect it from the power train.

5. Mark the sentences true (T) or false (F).

(Определите, верно или неверно утверждение).

1. We change the speed of the tractor using the gears in the transmission system.
2. Tractors normally have one forward gear and one reverse gear in the gearbox.
3. Large tractors need a larger number of gear ratios.
4. The differential is a part of the transmission system which helps to change the direction of movement.
5. You can move a tractor backwards due to the forward gears in the transmission.
6. PTO shaft is widely used in farm machinery.
7. Gearbox provides the means of engaging or disengaging the engine.
8. PTO shaft cannot be operated with the standing tractor.

9. Tractors can have more than three forward gears in the transmission.
10. There are gears that connect the drive shaft and the lay shaft in the gearbox.

6. Find the English equivalents for the following word combinations in the text.

(Найдите в тексте английские эквиваленты следующих словосочетаний).

1. *вторичный вал коробки передач*
2. *промежуточный вал*
3. *вал отбора мощности*
4. *конечная передача*
5. *поочерёдно присоединять к маховику*
6. *муфта сцепления*
7. *задняя ось*
8. *передавать крутящий момент двигателя*
9. *передаточное отношение*
10. *эффективно использовать*
11. *передняя передача*
12. *изменять направление движения*
13. *многодисковая муфта*
14. *ведущие колёса трактора*
15. *назначение дифференциала*

7.Match the words with their definitions.

(Подберите к словам соответствующие определения).

1.	transmission	a.	a toothed wheel that engages with another toothed wheel in order to change the speed or direction of transmitted motion
2.	drive shaft	b.	a mechanism for connecting and disconnecting an engine
3.	clutch	c.	the system of gears in an engine or vehicle
4.	reverse	d.	the mechanism by which power is transmitted from an engine to the axle in a motor vehicle
5.	gear	e.	a set of gears allowing a vehicle's driven wheels to revolve at different speeds when

going around corners

6. final drive — f. the last part of the transmission system in a motor vehicle
7. differential — g. a shaft in a car or other vehicle that transfers power from the gearbox to the wheels
8. gearbox — h. an auxiliary shaft in a gearbox, running parallel to the main shaft, to and from which drive is transferred to enable varying ratios to be obtained
9. engage — i. going in or turned towards the direction opposite to that previously stated
10. lay shaft — j. a heavy wheel that is part of some engines. It regulates the engine's rotation, making it operate at a steady speed.
11. shaft — k. move into position so as to come into operation
12. flywheel — l. a long cylindrical rotating rod

8. Translate the sentences given in the imperative mood.

(Переведите предложения, данные в повелительном наклонении).

1. Examine the gearbox.
2. Remove the power take off shaft.
3. Don’t forget to lubricate the gears.
4. Be careful with the working mechanism.
5. Follow the given recommendations.
6. Don’t use this tractor.
7. Remember that the higher the torque, the larger the gears and shafts should be.

9. Role play the dialogue.

(Разыграйте диалог по ролям).

At the car-service station

Client: Good morning, sir. I have come for a 15 thousand kilometers servicing. I have an appointment for 10 a.m.

Mechanic: OK. Please, drive your car into the garage… Let me check the car and diagnose all possible problems… Right. I will have to

replace the tyres, change the brake disk and check the oil level.

Client: Fine. Please check why my wipers get stuck in the middle of the windshield. And I've got some other problems as well. I've noticed that the clutch is very noisy when I change gears.

Mechanic: I see. The plate must be worn out. But it's a normal thing at this mileage. And I can see you have some minor problem with the radiator.

Client: Can I get it repaired today too?

Mechanic: I'm afraid it will take a couple of days to fix it. You can leave the car some other day. I'm sorry for the inconvenience.

Client: Ok then. Another problem is that my car won't start in the mornings. I usually call my neighbour to jump-start* it.

Mechanic: Let me open the hood and check all the hoses and belts. So… I'm glad to say they are all in working order. Did you check the battery? If you need to jump-start your car, you probably have to change the weak battery. When did you buy the last one?

Client: Oh, I guess it was ages ago. You're right. I have to replace it.

Mechanic: Right. There it is. Everything is in order in your car. The oil level was below the full mark, so I've filled it up. Take our 30-day warranty card, please.

Client: Great! How much is it?

Mechanic: It's 300 $ in total.

Client: Here you are. Thanks for your help. See you for a 30 thousand servicing.

* To jump-start a car - *завести автомобиль от внешнего источника - аккумулятора другого автомобиля*

For your self-study

(Задания для самостоятельной работы)

10. Translate the sentences into Russian.

(Переведите предложения на русский язык).

1. The principal function of the gearbox is to vary the speed of the car movement to meet the road conditions.
2. To connect the engine with the gearbox, the driver should engage the clutch.
3. The clutch is a friction device which is used for freeing the engine from the gearbox, for starting the car, and for releasing the engine from

the car wheels.
4. The clutch is fixed between the flywheel of the engine and the gearbox and consists of two plates (discs): the friction disc and the pressure disc.
5. The friction disc is situated between the flywheel and the pressure plate and has a hard-wearing material on each side.
6. The basic principal operation of the clutch is a frictional force acting between two discs.
7. The clutch is controlled by the clutch pedal.
8. When the pedal is at rest the clutch is engaged and the running engine is connected to the gearbox.
9. When the pedal is pressed down the clutch is disengaged and the engine runs idly.

11. Translate the sentences into Russian paying attention to the comparative degree of adjectives and adverbs.

(Переведите предложения на русский язык, обращая внимание на сравнительную степень прилагательных и наречий).

1. When one gear has *more* teeth than the other, the *smaller* gear will turn *more rapidly* than the *larger* one.
2. The varying gear ratios are necessary since the gasoline engine does not develop *much* power at low engine speeds.
3. Diesel engines have *higher* compression ratios and therefore burn fuel *more completely* and *efficiently*.
4. Diesel engines are built with heavy-duty parts to withstand the *higher* compression ratios and to operate for long periods with minimum breakdown.
5. It depends on engine size, but diesels generally produce *more* torque and power output than gasoline engines.
6. The differential normally allows the outside wheel to travel *faster* than the inside wheel during a turn.

12. Complete the sentences choosing the best alternative.

(Заполните пропуски в предложениях, выбрав наиболее подходящий вариант).

1. The transmission system allows ….
   a. *to change speeds*
   b. *to change the direction of movement*
   c. *to stop the vehicle*

2. The differential allows ….
   a. *to engage and disengage the drive from the engine to the transmission system*
   b. *to drive machines, such as combines, binders and other tools*
   c. *the tractor to turn*
3. The usual tractor speed for field work is … .
   a. *15 to 20 miles per hour*
   b. *2 to 6 miles per hour*
   c. *10 to 15 miles per hour*
4. The PTO shaft is….
   a. *at the front of the tractor*
   b. *at the rear of the tractor*
   c. *behind the clutch*
5. The clutch usually consists of … plates.
   a. *one or two*
   b. *two or three*
   c. *four or five*
6. The speed of the power take off shaft should … .
   a. *be independent of the forward speed of the tractor*
   b. *depend on the forward speed of the tractor*
   c. *be controlled only by engine speed*
7. If the tractor is built for rubber tires and it has one or more additional forward gears for road use it may be able to travel faster than … .
   a. *6 miles per hour*
   b. *15 miles per hour*
   c. *30 miles per hour*

Tillage equipment. Plows.

Почвообрабатывающее оборудование. Плуги.

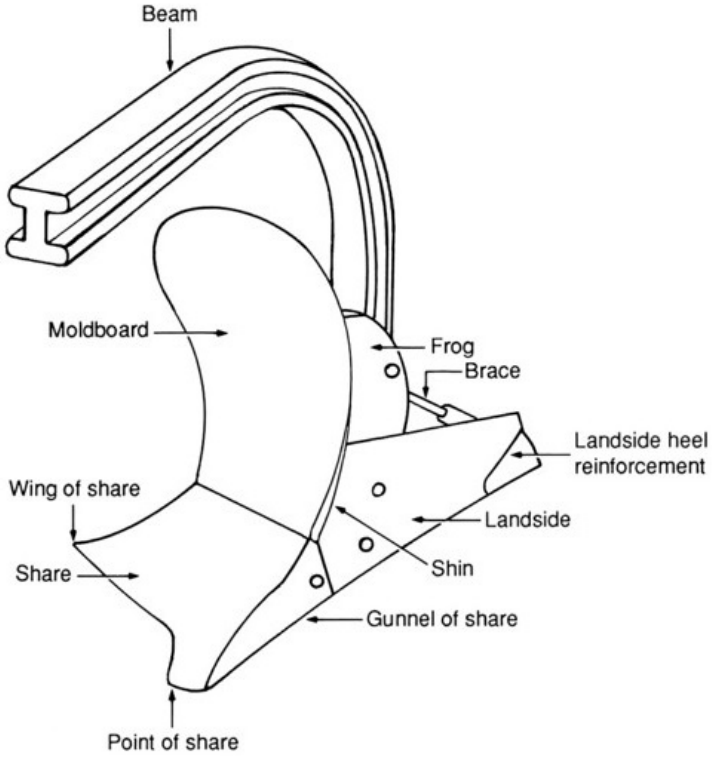
Tillage is the preparation of the soil for planting and keeping it free from weeds during the growth of the crops. The equipment used by the farmer to break and loosen the soil for a depth of 6 to 36 in (15.2 to 91.4 cm) is called primary tillage equipment. It includes the moldboard, disk, rotary, chisel and subsoil plows.

Secondary tillage means stirring the soil at shallow depths. There are many types of cultivators, harrows, rollers, pulverizers and other tools. Plow is the oldest agricultural tool. The moldboard plow is designed to cut and lift the soil, turn it over, and cover the crop residues.

It is generally considered to be the most important tillage tool. Our

common regular moldboard plows can be divided into two main groups. One way plow throws the soil only in one direction, usually to right (when seen from behind). Two way plow has the bottoms so arranged that the right-turning bottoms can be quickly and readily replaced with a set that turns the soil to the left. Thus when you reach the end of the furrow, you raise the plow, turn around, and return across the field plowing into the furrows you just made. Some plows are pulled behind the tractor and others are mounted on the tractor.

The modern plow is mounted directly on the tractor, or is attached to the three-pointed linkage. It is raised and lowered hydraulically. The typical mounted plow consists of a frame which is attached to the tractor. The main components in contact with the soil are the coulter, the share, the moldboard and the landside.



The coulter is carried by the frame of the plow. The share, moldboard and landside are all bolted to the frog, which is in turn bolted to the leg of the plow. The plow is carried by the frame. The job of the share is to penetrate and then undercut through the soil at the desired depth. Plow shares should be kept sharp, blunt shares do poor work and require more power and fuel to draw the plow along. The function of the coulter is to make a vertical cut and divide the soil that is raised by the share from the unplowed land. The coulter should not cut deeper than 3 to 4 in. The combination of the share and the coulter creates the furrow. The moldboard is the part of the plow which turns the furrow over. It is back of the share.

Disk plows. Tractor disk plow consists of a series of individually mounted, inclined disk blades on a frame supported by wheels.

It is most suitable for conditions under which the moldboard plow does not work satisfactorily. A disk plow can be operated in hard dry

soils where a moldboard plow will not penetrate in sticky soils, in stony, in soils containing heavy roots, and in peat lands.

The disk does not cover trash as thoroughly as moldboard plow, and under usual plowing conditions it leaves the field rougher and more cloddy. Disk plows usually have from one to seven concave disk blades, the disks on standard disk plows have diameters 24 and 32 in.

The trend is towards the larger-diameter disks because they permit deeper plowing where it is desired.

Do you know these words?

(Знаете ли вы эти слова?)

tillage	[ˈtılıdʒ]	*обработка почвы*
to loosen	[ˈlu:sən]	*рыхлить*
in. (inch)	[ınʧ]	*дюйм*
moldboard plow	[ˈməʊldbɔ:d plau]	*лемешной плуг*
chisel plow	[ʧızl plau]	*чизель, глубокорыхлитель*
subsoil plow	[ˈsʌbsɔıl plau]	*безотвальный плуг для глубокой пахоты, почвоуглубитель*
to plow	[plau]	*пахать*
to stir	[stə:]	*рыхлить, перемешивать*
shallow	[ˈʃæləʊ]	*мелкий, неглубокий*
harrow	[ˈhærəu]	*борона*
roller	[ˈrəulə]	*каток*
residue	[ˈrezıdju:]	*остаток*
one way plow		*простой корпусный плуг*
two way plow		*оборотный корпусный плуг*
bottom	[ˈbot əm]	*плужный корпус*
set	[set]	*комплект, набор*
furrow	[ˈfʌrəu]	*борозда*
to raise	[reız]	*поднимать*
to pull	[pul]	*тянуть*
to mount	[maunt]	*устанавливать, навешивать*
to attach	[əˈtæʧ]	*прикреплять*
three-pointed	[θri: ˈpoıntıd	*трёхточечное навесное*
linkage	ˈlıŋkıdʒ]	*устройство*
frame	[freım]	*рама*
coulter	[ˈkəultə]	*предплужник, нож плуга*
share	[ʃeə]	*лемех*

moldboard	[ˈməʊldbɔːd]	*отвал плуга*
landside	[ˈlænd˛saɪd]	*полевая доска*
frog	[frog]	*башмак*
leg	[leg]	*опорная стойка*
to penetrate	[ˈpenɪtreɪt]	*проникать*
depth	[depθ]	*глубина*
sharp	[ʃa:p]	*острый*
blunt	[blʌnt]	*тупой*
to draw (drew, drawn)	[dro:]	*тянуть*
inclined disk blades	[ɪnˈklaɪnd dɪsk bleɪdz]	*наклонные дисковые лемеха*
sticky	[ˈstɪkɪ]	*липкий*
peat	[pi:t]	*торф*
trash	[træʃ]	*растительные остатки*
rough	[rʌf]	*неровный*
concave	[koŋˈkeɪv]	*вогнутый*

1. Answer these questions:

(Ответьте на эти вопросы):

1. What is tillage?
2. What is primary tillage equipment?
3. What equipment is used for stirring the soil at shallow depths?
4. What agricultural tool is considered to be the most important?
5. What is the difference between one way plow and two way plow?
6. How is the modern plow attached to the tractor?
7. How is the modern plow raised and lowered?
8. What does the typical mounted plow consist of?
9. What is the job of the share?
10. What is the function of the coulter?
11. In what conditions should a disk plow be used?
12. What are the disadvantages of a disk plow?

2. Match the antonyms from the columns.

(Соедините антонимы из колонок).

1. sharp	a. shallow
2. deep	b. horizontal
3. to raise	c. blunt
4. vertical	d. unplowed

5. plowed	e. smooth
6. primary	f. secondary
7. rough	g. lower

3.Put the verbs into the proper columns according to the reading rules of the word end.

(*Распределите глаголы в колонки в сооветствии с правилами чтения окончания –ed).*

Carried, bolted, supported, designed, divided, arranged, used, called, considered, replaced, pulled, mounted, attached, raised, lowered, operated, desired.

[t]	[d]	[ɪd]

4. Find the English equivalents for the following word combinations in the text.

(Найдите в тексте английские эквиваленты следующих словосочетаний).

1. *орудия для первичной обработки почвы*
2. *рыхлить почву*
3. *старейшее сельскохозяйственное орудие*
4. *лемешной плуг*
5. *безотвальный плуг*
6. *оборотный корпусный плуг*
7. *трёхточечное навесное устройство*
8. *наклонные дисковые лемеха*
9. *навешиваться непосредственно на трактор*
10. *крепить болтами к опорной стойке плуга*
11. *переворачивать пахотный слой*
12. *проникать в липкую почву*
13. *торфяные почвы*
14. *тщательно покрывать растительные остатки*
15. *давать возможность для более глубокой вспашки*

5. Match the words with their definitions.

(Подберите к словам соответствующие определения).

1. ploughshare a. a curved metal blade in a plow that turns the earth over

2. coulter	b.	the part of a plough that slides along the face of the furrow wall on the opposite side to the mouldboard
3. moldboard	c.	a kind of plough with no mouldboard, used to loosen the soil at some depth below the surface without turning it over
4. furrow	d.	a blade fixed in front of a plowshare attached to a plough to cut through the soil vertically in advance of the ploughshare
5. plow	e.	a long narrow trench made in the ground by a plow
6. subsoiler	f.	an implement consisting of a heavy frame set with teeth or tines which is dragged over ploughed land to break up clods, remove weeds, and cover seed
7. landside	g.	the horizontal pointed cutting blade of a mouldboard plough
8. harrow	h.	a large farming implement with one or more blades fixed in a frame, drawn over soil to turn it over and cut furrows in preparation for the planting of seeds

6.Mark the sentences true (T) or false (F).

(Определите, верно или неверно утверждение).

1. The mouldboard plow is the most important tillage tool.
2. Various types of cultivators, harrows, rollers, pulverizers, and other tools are used for secondary tillage.
3. Stirring the soil at shallow depths is called primary tillage.
4. Blunt shares economize fuel.
5. Disk plows are used in hard dry soils.
6. Larger disks allow deeper plowing.

7. Fill in the blanks using the given words.

(Заполните пропуски, используя данные слова).

bottoms	plough	speed
implement	plowing	tillage

1. The mouldboard … greatly reduced the amount of time needed to prepare a field, and as a consequence, allowed a farmer to work a larger

area of land.
2. The chisel plough is a common tool to get deep … with limited soil disruption.
3. Tractor-drawn plows have from 1 to 14 hydraulically lifted and controlled … .
4. The penetration of the disk plow is influenced by the weight of the …, so there is always some provision made for adding weight to secure the desired penetration in stiff soil.
5. The correct speed of the tractor is important for good …, the best speed is from 2.4km/hr depending upon the soil and other field conditions.
6. The usual thumb rule for estimating the output of an agricultural field operation is to multiply the effective working width of the implement in meters by the … of implement in km/hr.

8. Study the notes and role play the dialogue.
(Изучите примечания и разыграйте диалог по ролям).

Car repairs

Mechanic: What can we do for you today?
Car owner: Uh, hi. Yes, I'm having a problem with my car, and it doesn't seem to run right. I mean every time I start it up, the engine runs for a minute or so, *sputters* like it isn't getting enough gas, and then dies.
Mechanic: Hmmm. Okay. Let's open the hood, and let's take a look . . . Okay, start her up.
[*Engine starting* . . .]
Okay, Okay. Shut her off. Hmmm. [*So* . . .] Let me look at the book here . . . [It] sounds like a possible fuel line, a dirty *carburetor*, bad *alternator,* or even a weak battery.
Car owner: So, which one is it?
Mechanic: Uhh. Difficult to say. Let me try this . . . Uh, alright . . . You need to talk to the mechanic.
Car owner: The mechanic! So, who are you?
Mechanic: Well, I'm the assistant, and I've only been here on the job for two days.
Car owner: So, why didn't you tell me that in the first place? I mean, I wouldn't have wasted all this time!
Mechanic: You didn't ask.

Car owner: Okay, so how much is it going to cost?

Mechanic: Ah. Difficult to say. [*That's what you said about the last thing!*] Are you a local or from out of town?

Car owner: I'm just passing through, and this is the only place for miles. [*Yeah, that's right.*] Man, can't you see my license plate? [*Sure did!*]

Mechanic: Okay. The out-of-town rate. Let's see. Okay, here we go. If it's a fuel line, that'll be $100 . . . No, no, that's the local rate. Here, $200 for the pre-screening check, $150 for parts, plus or minus $100, and $75 an hour for labor. Oh, oh yeah. Today's a holiday, so labor is actually $50 more per hour.

Car owner: Huh? Those prices are *outrageous*, and what holiday is it today?

Mechanic: Oh, it's the local pumpkin festival.

Car owner: Ah, come on. I can't believe this. Of all my luck, my car breaks down in an *out-of-the-way* town [*That's right.*], and it'll *cost an arm and a leg* to get my car fixed.

Mechanic: Ah, we'll take care of you. Just bring the car back on Tuesday so Mike, our mechanic, can take a look at it.

Car owner: Why not today? It's only 11:00 a.m.!

Mechanic: Ah, we close at 11:30 a.m. on holidays, and we're closed tomorrow and Sunday, and we're closed the following day as well.

Car owner: I can't wait that long! I need my car repaired now.

Mechanic: Well, next week is the best we can do, but you can talk to Mike at the Pumpkin Festival. This town will grow on you. [*Ah, man!*]

Notes:

To sputter - make consecutive explosive noises

My car tends to *sputter* a lot in cold weather when I start it up.

Carburetor - part of the engine that mixes air with gasoline vapor before combustion

The *carburetor* needs to be fixed or replaced.

Alternator - a generator that produces electrical current

There must be a problem with the *alternator* in my old truck.

Outrageous - very expensive

The cost of repairing the old car would have been *outrageous,* so that I decided to buy a new one instead.

Out-of-the-way - remote or far from populated areas

We took a trip to an *out-of-the-way* ghost town during our vacation.

To cost an arm and a leg - be very expensive, outrageous
It *cost me an arm and a leg* to fix the damage to my sports car.

For your self-study

(Задания для самостоятельной работы)

9. Translate the sentences into Russian.

(Переведите предложения на русский язык).

1. Plows are even used under the sea, for the laying of cables.
2. Disk plows usually have three or more individually mounted concave disks that are inclined backward to achieve maximum depth.
3. The rotary plow has an assembly of knives on the shaft to mix the surface growth with the soil.
4. This plow has adjustable disc scrapers to ensure that the disc remains clean in all conditions.
5. The chisel plough increases natural fertility of soil as deep tillage provides enough circulation of air, moisture and sunlight into soil.
6. The daily checking of plough adjustments, tightening of bolts and nuts on the frame and bottoms and the regular attention to lubrication and replacement of worn out parts prolong the life and lower the cost of plowing.

10. Complete the sentences choosing the best alternative.

(Заполните пропуски в предложениях, выбрав наиболее подходящий вариант).

1. Secondary tillage means … .
   a. *breaking and loosening the soil for a depth of 6 to 36 in*
   b. *breaking and loosening the soil for a depth of 15.2 to 91.4 cm*
   c. *stirring the soil at shallow depths*
2. … is the oldest agricultural tool.
   a. *harrow*
   b. *roller*
   c. *plow*
3. … throws the soil only in one direction, usually to right.
   a. *one way plow*
   b. *two way plow*
   c. *right-turning bottom*
4. The main components in contact with the soil are the coulter, the…, the moldboard, and the landside.

a. share
b. frame
c. frog

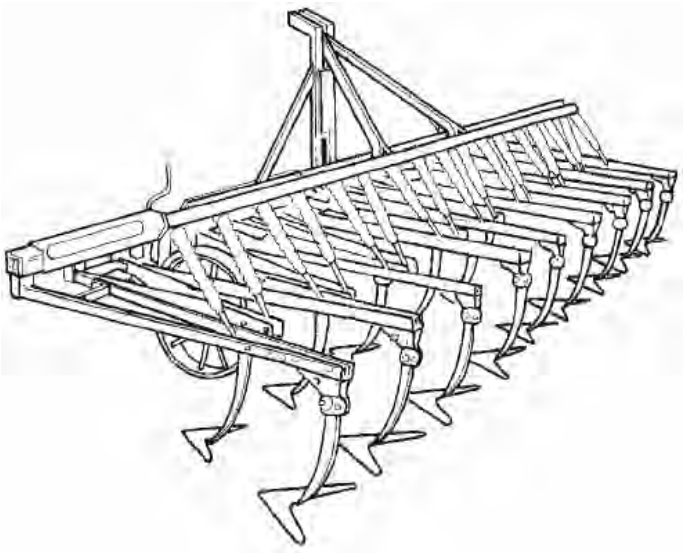
5. The combination of the share and the coulter creates the … .
   a. frog
   b. landside
   c. furrow
6. The share, moldboard and landside are bolted to the … .
   a. frame
   b. frog
   c. coulter

Cultivators and harrows

Культиваторы и бороны

Cultivation is an important operation in plant growing.

One knows the primary aim of cultivation is to retain moisture, to aerate the soil and to promote activity of microorganisms. The growth of plants always shows whether the soil is cultivated well.



There are many types of cultivators. The type and size needed will depend upon the kind of the crop, soil type and conditions. The present-day farm machinery designer is interested primarily in tractor-mounted cultivators.

Cultivating equipment for track-type tractors is mounted either in front of or to the rear of the tractor.

Central-forward tractor mounted cultivators are in one-, two-, four-, six-, and eight-row sizes. Cultivator units can be mounted on both the four-wheel and the three-wheel tractors. The gangs are hydraulically raised and lowered, and in some cases controlled hydraulically for depth of cultivation.

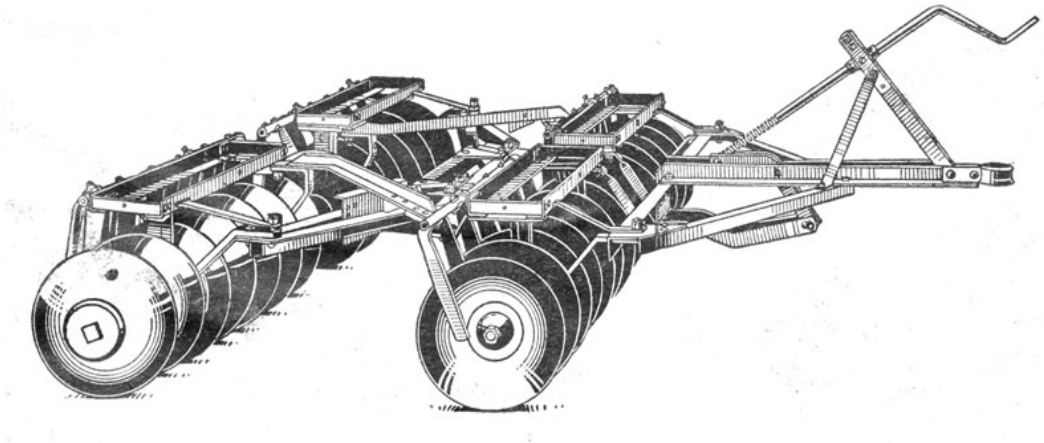
Rear mounted cultivators are usually unit assemblies attached to tractors equipped with a three-point hitch as a single unit. Each gang is provided with a three-point hitch as a single unit and a gang wheel to control the depth of cultivation.

Cultivators which only work to a depth of 6 in. are called harrows. There is no essential difference between cultivators and harrows. Cultivators are used to deal with heavy work and large clods, and harrows are later employed to continue the work of preparing a fine tilth.

The tines are used on the older types of harrows. They consist of four or five rows of either rigid or spring tines mounted on a frame. Such tines loosen the soil and lift weeds to the surface. There are three principle kinds of harrows, namely, the disk, the spike-tooth and the spring-tooth. Disk harrows are divided into two general classes: trailing and mounted.

Some trailed disk harrows have wheels between the front and the rear gangs that are used for depth control, for raising the harrow at the end of the field, and for transport on roads.

Their weight is limited because they must be lifted by the tractor.



Spike-tooth harrow is often pulled directly behind the plow. This tool is effectively used in killing small weeds that begin to grow, and to level the soil after plowing.

Spring-tooth harrows are effectively used in rough and stony ground to loosen previously plowed soil.

Do you know these words?

(Знаете ли вы эти слова?)

to retain	[rɪˈteɪn]	*сохранять*
to promote	[prəˈməut]	*способствовать*
moisture	[ˈmɔɪsʧə]	*влага*
to depend upon	[dɪˈpend əˈpon]	*зависеть от*
to mount	[maunt]	*навешивать*
rear	[rɪə]	*задний*
forward	[ˈfo:wəd ˈmauntɪdˈ	*культиватор*
mounted	kʌltɪveɪtə]	*фронтальной навески*

cultivator		
rear mounted cultivator	[rɪəˈmauntɪd ˈkʌltɪveɪtə]	*культиватор задней навески*
available	[əˈveɪləbl]	*доступный*
unit assembly	[ˈju:nɪt əˈsemblɪ]	*унифицированный узел*
gang	[gæŋ]	*секция*
three-point hitch	[θri: ˈpoɪnt hɪʧ]	*трёхточечная сцепка*
tine	[taɪn]	*зуб*
rigid	[ˈrɪdʒɪd]	*неподвижный, жёсткий*
spring	[sprɪŋ]	*пружина*
spike-tooth harrow	[spaɪk tu:θ ˈhærəu]	*зубовая борона*
spring-tooth harrow	[sprɪŋ tu:θ ˈhærəu]	*борона с пружинным зубом*

1. Answer these questions:

(Ответьте на эти вопросы):

1. What is the aim of cultivation?
2. How can one see that the soil is cultivated well?
3. What does the type and the size of the cultivator depend upon?
4. What cultivators are modern farm machinery designers primarily interested in?
5. How can the cultivating equipment for track-type tractors be mounted?
6. What device is commonly used to attach rear mounted cultivators to tractors?
7. How are the gangs operated?
8. What is used to control the depth of cultivation?
9. Is there any essential difference between cultivators and harrows? Are they used for different kinds of work?
10. What are the tines used for?
11. What types of harrows can you name?
12. Why do some trailed disk harrows have wheels between the front and the rear gangs?
13. What kinds of field work are spike-tooth harrows used for?
14. Where can spring-tooth harrows be successfully used?

2. Mark the sentences true (T) or false (F).

(Определите, верно или неверно утверждение).

1. Cultivation is done to promote the growth of plants.
2. Cultivating equipment can be mounted only to the rear of the tractor.
3. Hydraulics is used to raise and lower the gangs of cultivators.
4. Three-point hitch is provided to control the depth of cultivation.
5. Harrows are actually cultivators working to a depth of 10 in.
6. Modern types of harrows are provided with the tines.
7. Harrows are divided into 3 general types.
8. There are 3 classes of disk harrows.
9. The weight of harrows is not important.
10. Rough and stony ground requires the use of spring-tooth harrows.

3.Find the odd word in each row.

(Найдите лишнее слово в каждом ряду).

1. harrow, cultivator, roller, clod;
2. rough, rigid, stony, heavy;
3. hydraulically, stony, directly, effectively;
4. attached, mounted, lifted, interested;
5. tine, size, unit, spike.

4. Find the English equivalents for the following word combinations in the text.

(Найдите в тексте английские эквиваленты следующих словосочетаний).

1. *трактора, оснащённые трёхточечной сцепкой*
2. *борона с пружинным зубом*
3. *сохранять влагу*
4. *способствовать деятельности микроорганизмов*
5. *современный конструктор сельскохозяйственной техники*
6. *поднимать и опускать секции культиватора с помощью гидравлики*
7. *культиватор задней навески*
8. *прицепные и навесные дисковые бороны*
9. *бороться с мелкими сорняками*
10. *выравнивать почву после вспашки*
11. *рыхлить вспаханную почву*
12. *поднимать сорняки на* поверхность

For your self-study

(Задания для самостоятельной работы)

5.Match the words with their definitions.

(Подберите к словам соответствующие определения).

1.	three-point hitch	a.	a farm implement equipped with shovels, blades, etc., used to break up soil and remove weeds.
2.	disk harrow	b.	a piece of farm equipment consisting of a row of blades fixed to a heavy frame. When it is pulled over ploughed land, the blades break up large lumps of soil.
3.	spring-tooth harrow	c.	a set of mechanical devices grouped together.
4.	gang	d.	a device resembling either a triangle, or the letter A used to attach various implements to an agricultural tractor.
5.	cultivator	e.	a type of tine harrow with many flexible iron teeth mounted in rows to loosen the soil before planting.
6.	harrow	f.	a harrow with cutting edges consisting of a row of concave disks set at an oblique angle.

6. Fill in the blanks using the given words.

(Заполните пропуски, используя данные слова).

disc	hydraulic	harrows
spike	spring	

1. In general, cultivators are used for heavy work and for breaking large clods and the … are used for lighter operations.
2. Cultivators are either …-tined or rigid-tined.
3. … harrows are used mainly for tillage in heavy or hard soils, but can also be used for a variety of other operations such as the covering of seed and destruction of weeds.
4. The … toothed harrows are mostly used for light work and can be operated with small wheel tractors.
5. … equipment or machinery is operated by a fluid that is under pressure, such as water or oil.

Combine Harvester

Уборочный комбайн

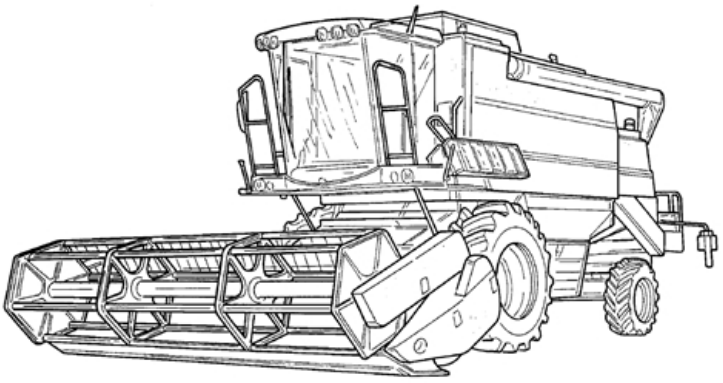
Harvesting the crop under the best conditions, the grower uses several harvesting machines: hay harvesting, grain harvesting, root crop harvesting machines etc.

The grain combine is adapted to harvest all the small grains, soy beans, rice as well as many other crops.

There are two general types of combines: the pull or tractor-drawn and the self-propelled machines.

The basic operational functions of a combine can be divided as follows:

- cutting the standing grain,
- separating the grain from the straw,
- cleaning the grain by removing chaff,
- handling the grain from the combine to the tank or the truck.



The combine harvester is a machine that requires careful and systematic lubrication. There are many oiling points, some of which will require attention more than once daily, others daily and some weekly. It is worthwhile for a combine driver to spend an hour each morning attending to lubrication servicing and other maintenance jobs that need to be done. If a combine is of self-propelled type it will be powered by an engine and this will require the same sort of attention as does a tractor engine. These are the air cleaner and the radiator. A combine works in very dusty conditions therefore the operator must ensure that neither of these units become with dirt.

Each morning before work the combine operator should do at least the following:

1. Remove any trash that may have collected around drive pulleys.
2. Check the cutting mechanisms.
3. Check the tensions of the drive chains and belts.
4. Lubricate all oiling points.

Do you know these words?

(Знаете ли вы эти слова?)

harvesting	[ˈhɑːvɪstɪŋ]	*уборка урожая*
combine harvester	[ˈkɒmbaɪn ˈhɑːvɪstə]	*способствовать*
grain combine	[greɪn ˈkɒmbaɪn]	*зерноуборочный комбайн*
crop	[krɒp]	*сельскохозяйственная культура*
tractor-drawn	[ˈtræktər drɔːn]	*на тракторной тяге*
self-propelled	[self prəˈpeld]	*самоходный*
straw	[strɔː]	*солома*
chaff	[ʧɑːf]	*шелуха*
tank	[tæŋk]	*бак*
maintenance	[ˈmeɪntənəns]	*техническое обслуживание*
drive pulley	[draɪv ˈpʊlɪ]	*приводной шкив*
tension	[tenʃn]	*напряжение*

1. Answer these questions:
(Ответьте на эти вопросы):
1. What harvesting machines can you name?
2. What crops is the grain combine adapted to harvest?
3. What are the two general types of combines?
4. What operations can a combine perform?
5. How often are the oiling points of the combine harvester lubricated?
6. What should the combine operator do each morning before work?

2. Mark the sentences true (T) or false (F).
(Определите, верно или неверно утверждение).
1. The grain combine is adapted to harvest only the small grains.
2. Root crop harvesting machines are used to harvest soy beans.
3. Some combines are tractor-drawn, others are self-propelled.
4. There are just a few oiling points in the combine harvester requiring monthly lubrication.
5. It takes a combine driver an hour each morning to do lubrication and other maintenance jobs.
6. Every other day a combine driver should check the cutting mechanisms.

3. Find the odd word or word combination in each row.
(Найдите лишнее слово или словосочетание в каждом ряду).
1. small grains, soy beans, rice, root crops;

2. weekly, quickly, monthly, daily;
3. grower, harvester, driver, teacher;
4. servicing, morning, oiling, cutting;
5. condition, lubrication, connection, tension;
6. required, lubricated, adapted, divided.

4. Put the verbs into proper columns according to the reading rules of the word end.

(Распределите глаголы в колонки в соответствии с правилами чтения окончания ***-ed****).*

[t]	**[d]**	**[ɪd]**

Adapted, divided, powered, required, cleaned, checked, lubricated, removed, collected, harvested, pulled, separated, handled, used.

5. Match the words from the columns to make word combinations from the text.

(*Соедините слова из колонок, чтобы образовать словосочетания из текста).*

1. to remove	a. attention
2. oiling	b. point
3. to require	c. lubrication
4. dusty	d. mechanisms
5. cutting	e. machine
6. careful	f. jobs
7. maintenance	g. conditions
8. self-propelled	h. chaff

6. Find the English equivalents for the following word combinations in the text.

(Найдите в тексте английские эквиваленты следующих словосочетаний).

1. *машины для уборки корнеплодов*
2. *самоходные машины*
3. *машины на тракторной тяге*
4. *отделять зерно от соломы*
5. *требовать тщательной систематической смазки*
6. *точка смазки*
7. *техническое обслуживание*

8. *проверять натяжение приводных цепей и ремней*
9. *вокруг шкивов привода*

7. Translate the sentences into Russian, define the part of speech of the words in italics.

(Переведите предложения на русский язык, определите часть речи выделенных курсивом слов).

1. The long hot summer has led to a record *harvest* this year.
2. In the US, farmers *harvest* winter wheat in the early summer.
3. When hydrogen and oxygen molecules *combine* to form water, heat and electricity are produced.
4. I learned to operate a *combine* on my uncle's farm.
5. You may need to *oil* the wheels and joints.
6. Change your car's *oil* every 12,000 miles.
7. They *drive* their kids to school every morning.
8. This is a four-wheel *drive* truck with all-wheel steering.
9. Where's the nearest car *service* station?
10. The company sends a *service* engineer to fix the disk drive before it fails.
11. This mechanic as a rule *services* my car.

8. Fill in the blanks using the given words.

(Заполните пропуски, используя данные слова).

lubrication	oiling	chaff	grain
driver	dusty	self-propelled	

1. Cleaning the grain by removing … is one of the basic operational functions of a combine.
2. Combines can be either tractor-drawn or … machines.
3. Combines require careful and systematic … .
4. A combine works in very … conditions.
5. These … points should be lubricated daily.
6. The … combine is adapted to harvest all the small grains, soy beans, rice as well as many other crops.
7. Every morning a combine … spends an hour attending to lubrication servicing and other maintenance jobs that need to be done.

9. Complete the sentences choosing the best alternative.

(Заполните пропуски в предложениях, выбрав наиболее подходящий вариант).

1. Harvesting the crop under the best conditions, the grower uses … harvesting machines.
   a. *hay*
   b. *grain*
   c. *root crop*
2. The grain combine is adapted to harvest … , soy beans, rice and many other crops.
   a. *the small grains*
   b. *root crops*
   c. *potatoes*
3. There are two general types of combines: the pull or tractor-drawn and … machines.
   a. *hay harvesting*
   b. *self-propelled*
   c. *grain harvesting*
4. The combine harvester requires careful and systematic … of the oiling points.
   a. *lubrication*
   b. *maintenance*
   c. *removal*
5. Every morning before work the combine operator should … .
   a. *clean the grain by removing chaff*
   b. *separate the grain from the straw*
   c. *check the tensions of the drive chains and belts*

For your self-study

(Задания для самостоятельной работы)

10. Translate the sentences into Russian.

(Переведите предложения на русский язык).

1. You can transfer both components easily from one vehicle to another no matter whether it’s a tractor, combine, forage harvester or self-propelled sprayer.
2. The system automatically records harvesting data on combines and forage harvesters for analysis, such as yield, moisture content and fuel consumption.
3. The guarantee includes the repair and maintenance of the equipment.

4. We ensure regular inspection and maintenance of the machines.
5. Our latest machine is John Deere self-propelled 5430i, which replaces our two existing trailed sprayers.
6. All controls are ergonomically positioned just were you need them.
7. The hydro handle puts critical control functions in the palm of your hand for easy, stress-free operation.

11. Match the words with their definitions.
(Подберите к словам соответствующие определения).

1.	chaff	a.	a large farming machine that cuts the plant, separates the seed from the stem, and cleans the grain as it moves across a field
2.	maintenance	b.	a container that holds liquid or gas
3.	tank	c.	the work needed to keep a machine in good condition
4.	combine	d.	the dried yellow stems of crops such as wheat, used as food for animals or as a layer on the ground for animals to lie on
5.	self-propelled	e.	(of a vehicle) provided with its own source of tractive power rather than requiring an external means of propulsion
6.	hay	f.	the outer layer that is separated from grains such as wheat before they are used as food
7.	straw	g.	grass that is cut and dried and used as animal food

Implements for growing crops

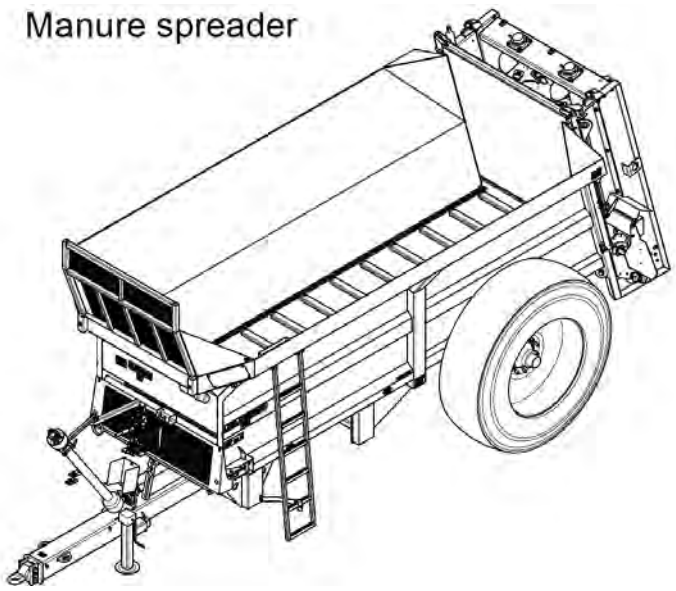
Орудия для выращивания сельскохозяйственных культур

Many types of implements have been developed for the activities involved in growing crops. These activities include breaking ground, planting, weeding, fertilizing, and combating pests.

Ground is broken by ploughs to prepare the seed-bed. A plough consists of a blade-like ploughshare that cuts under, then lifts, turns, and pulverizes the soil. Modern tractor ploughs are usually equipped with two or more ploughshares so that a wide area of ground can be broken at a single sweep. Harrows are used to smooth the ploughed land and sometimes to cover seeds and fertilizer with earth. The disc harrow,

which has curved, sharp-edged steel discs, is used mainly to cut up crop residues before ploughing and to bury weeds during seedbed preparation. Rollers with V-shaped wheels break up clods of soil to improve the aeration of the soil and its capacity for taking in water.

Some cereal crops are still planted by broadcasting seeds - that is, by scattering the seeds over a wide area. Machines for broadcasting usually consist of a long seed-box mounted on wheels and equipped with an agitator to distribute the seeds. Broadcast seeds are not always covered by a uniform or sufficient depth of soil, so seeding is more often done with drills, which produce continuous furrows of uniform depth. Specialized implements called planters are necessary for sowing crops that are planted in rows, such as maize. Maize planters and other similar machines have a special feed wheel that picks up small quantities of grain or separate kernels and places them in the ground.


Manure spreader

Fertilizer can be distributed during the winter or shortly before seeding time. Commercial fertilizers are commonly distributed, along with seeds, by drills and planters. Manure is distributed most efficiently by a manure spreader, which is a wagon equipped with a bottom conveyor to carry the fertilizer back to a beater attachment, which disintegrates it and then scatters it on the ground.

After crops have begun to grow, a cultivator is used to destroy weeds and loosen and aerate the soil. A flame weeder, which produces a hot-air blast, can be used to destroy weeds growing around crops, such as cotton, that have stems of tough bark. The weeds are vulnerable to the hot air, but the tough stems protect the crops from damage. Chemical herbicides applied in the form of a spray or as granules are used extensively for weed control.

Do you know these words?
(Знаете ли вы эти слова?)

implement	[ˈɪmplɪmənt]	*орудие, инструмент*
to plant	[plɑ:nt]	*сажать*
to weed	[wi:d]	*пропалывать, уничтожать сорняки*
to fertilize	[ˈfɜ:tɪlaɪz]	*вносить удобрение*
fertilizer	[ˈfɜ:tɪlaɪzə]	*удобрение*
to combat pests	[ˈkɒmbæt pests]	*бороться с вредителями*
seed-bed	[ˈsi:dbed]	*почва под посев*
ploughshare	[ˈplaʊʃeə]	*лемех*
to pulverize	[ˈpʌlvəraɪz]	*измельчать*
at a single sweep	[æt ə sɪŋgl swi:p]	*за один раз*
to smooth	[smu:ð]	*сглаживать*
crop	[krɒp]	*сельскохозяйственная культура*
residue	[ˈrezɪdju:]	*остаток*
clod	[klɒd]	*ком земли*
cereal crop	[ˈsɪəriəl krɒp]	*зерновая культура*
to broadcast	[ˈbrɒdkɑ:st]	*разбрасывать*
to scatter	[ˈskætə]	*разбрасывать, рассеивать*
agitator	[ˈædʒɪteɪtə]	*мешалка*
drill	[drɪl]	*рядовая сеялка*
furrow	[ˈfʌrəʊ]	*борозда*
planter	[ˈplɑ:ntə]	*сажалка, сеялка*
feed wheel	[fi:d wi:l]	*подающее колесо*
kernel	[kɜ:nl]	*зерно*
commercial fertilizer	[kəˈmɜ:ʃəl ˈfɜ:tɪlaɪzə]	*химическое удобрение*
manure	[məˈnjʊə]	*навоз, органическое удобрение*
manure spreader	[məˈnjʊə ˈspredə]	*разбрасыватель навоза*
beater	[ˈbi:tə]	*лопасть мешалки*
flame weeder	[fleɪm ˈwi:də]	*огневой культиватор*
hot-air blast	[hɒt eə blɑ:st]	*струя горячего воздуха*
tough	[tʌf]	*жесткий, прочный*
vulnerable	[ˈvʌln(ə)rəb(ə)l]	*уязвимый*
herbicide	[ˈhɜ:bɪsaɪd]	*гербицид*

1. Answer these questions:
(Ответьте на эти вопросы):

1. What are the activities involved in growing crops?
2. What implements are used for breaking the ground?
3. Why are modern tractor ploughs equipped with two or more ploughshares?
4. What are rollers with V-shaped wheels used for?
5. What does the term ‘broadcasting seeds’ mean?
6. What are the machines for broadcasting seeds equipped with?
7. When are planters used?
8. How are commercial fertilizers distributed?
9. What is a manure spreader?
10. What is a cultivator used for?
11. In what forms are chemical herbicides applied?

2. Match the synonyms from the columns.

(Соедините синонимы из колонок).

1. herbicide	a. manure
2. to broadcast	b. to scatter
3. fertilizer	c. planting
4. grain	d. kernel
5. seeding	e. weed killer
6. to distribute	f. hard
7. to disintegrate	g. to kill
8. to destroy	h. to divide
9. tough	i. in one pass
10. at a single sweep	j. to spread

3. Match the antonyms from the columns.

(Соедините антонимы из колонок).

1. sharp	a. narrow
2. sufficient	b. uneven
3. wide	c. insufficient
4. uniform	d. interrupted
5. continuous	e. to disintegrate
6. to integrate	f. soft
7. tough	g. blunt

4. Match the words from the columns to make word combinations from the text.

(*Соедините слова из колонок, чтобы образовать словосочетания из текста).*

1. commercial	a. residue
2. feed	b. weeder
3. manure	c. pests
4. crop	d. the soil
5. flame	e. preparation
6. to combat	f. harrow
7. to pulverize	g. implement
8. disk	h. the soil
9. seedbed	i. wheel
10. specialized	j. spreader

5. Find the English equivalents for the following word combinations in the text.

(Найдите в тексте английские эквиваленты следующих словосочетаний).

1. *готовить пашню*
2. *использовать для выравнивания вспаханной земли*
3. *закапывать сорняки*
4. *разбрасывание семян*
5. *специализированные орудия*
6. *распределять удобрение*
7. *незадолго до посадки*
8. *химические удобрения*
9. *разбрасыватель навоза*
10. *уничтожать сорняки*
11. *рыхлить и аэрировать почву*
12. *уязвимый перед горячим воздухом*
13. *защищать сельскохозяйственные культуры*
14. *применять в форме спрея или гранул*
15. *широко использоваться для борьбы с сорняками*

6. Match the words with their definitions.

(Подберите к словам соответствующие определения).

1. cereal	a. any wild plant that grows in an unwanted place, especially in a garden or field where it prevents the cultivated plants from growing freely
2. fertilizer	b. a tool or other piece of equipment for doing work that can be moved by hand or pulled

			across a surface
3.	implement	c.	a natural or chemical substance that is spread on the land or given to plants, to make plants grow well
4.	pest	d.	solid waste from animals, especially horses, that is spread on the land in order to make plants grow well
5.	planter	e.	a plant that is grown to produce grain
6.	furrow	f.	a long shallow trench in the ground (especially one made by a plow)
7.	weed	g.	the sharp blade of a plough
8.	manure	h.	an insect or small animal that is harmful or damages crops
9.	herbicide	i.	a machine used to plant crops
10.	ploughshare	j.	a chemical that is used to destroy plants, especially weeds

For your self-study

(Задания для самостоятельной работы)

7. Mark the sentences true (T) or false (F).

(Определите, верно или неверно утверждение).

1. Fertilizer is used to break the ground.
2. A V-shaped ploughshare is a part of a plough, it is used to smooth the ploughed land.
3. Rollers break up large clods of soil.
4. Seeding is usually done by broadcasting seeds.
5. Planters are used to sow crops in rows.
6. Fertilizer is commonly distributed during the summer time.

8. Translate the sentences into Russian.

(Переведите предложения на русский язык).

1. Weed control is another progressing field in robotics, where the crops and weeds can be identified online by advanced sensors that can direct harrow teeth and pesticide sprayers towards single plants or areas infected by weeds.

2. Broadcasting of the fertilizer in flooded rice fields is easy and can be done in less than a day for an entire hectare.
3. This manure spreader with the loading capacity of 6 tons on a double suspension is equipped with a four drum vertical adapter tilted forward, which guarantees an even, wide spreading of manure.
4. The plow sped along the furrow, turning over the earth.
5. The production of ploughshares and other spares, and of machinery generally, is steadily increasing.
6. An ordinary ploughshare when it is in use is pulled through soil for a distance of twelve miles in a day.
7. Adjust the drawbar length to suit the tractor thus preventing the tractor wheels from touching the planter when turning.
8. A detachable computer can be used on the precision spaced planter as well as on the combine; therefore, software and computer need to be purchased only once.
9. To ensure the efficient running of the planter and to avoid premature repairs, make sure that the machine is well looked after and that repairs are carried out in time.
10. This lightweight and compact planter is easy to operate, low in maintenance and can be used with small tractors.
11. This precision spaced planter – available in 2-, 4- or 6-row versions – lets you conveniently adjust the row spacing from 25 to 100 cm using hydraulics.

My future profession

Моя будущая профессия

A profession is an occupation that requires specialized advanced education. There are many interesting and useful professions, and it is really not an easy task to choose the right one. I think the profession should be chosen according to your wants, interests and abilities.

After finishing secondary school many of my classmates decided to enter agricultural higher education establishments to become agronomists, accountants, veterinary surgeons. I want to be a mechanical engineer because I like machines and want to know more of them. Now I am a second-year student and clearly realize my future profession of a mechanical engineer.

At this moment the profession of an engineer is once again becoming prestigious and well-paid. Engineers are required and highly valued. The fields of work carried out by the mechanical engineer are extremely diverse and broad. In all branches of industry and in agriculture machines, devices and vehicles make the material basis of production. Any failure of the machine due to a malfunction means stopping the operation and causes material losses. The demand for increased efficiency is continually raising the quality of work expected from a mechanical engineer and requiring a higher degree of education and training.

We'll most likely work on the farms of our region. Here we'll have many opportunities to make use of our knowledge in farm production. Different kinds of machinery are at the disposal of a mechanical engineer: caterpillar and wheel tractors, implements for cultivating the soil, planting and harvesting machinery, and many other machines.

A mechanical engineer is to organize production in accordance with the latest technology and scientific recommendations. In order that all the mechanisms work perfectly it is necessary to organize the work of the equipment properly and its repair in time.

Mechanization makes the people's work easier, lowers labour expenses and the cost of production. The introduction of all-round mechanization into all branches of farm production is the basic task of the mechanical engineer.

As in any engineering higher school we first have to learn a lot about everything, then all about a little. The first years are spent on getting a fundamental grounding in Mathematics, Physics, Chemistry and other general education subjects such as the History of Russia, Philosophy, foreign languages. Then come general engineering subjects, such as the theory of mechanisms, resistance of materials, electrical engineering, hydraulics. And only after that special subjects are introduced: tractors, motorcars, agricultural machines and their repair, mechanization of animal breeding farms, etc.

Besides, we are to know something about agronomy, economics and organization of agricultural production, the safety of production

activity, labour laws in Russia, protection of environment and so on.

Without a broad general education an engineer can only follow the rails – he is a poor engineer, for technology changes very quickly. The most important part of our higher education is to learn thinking independently. That is what the entire study course is about.

Well-equipped laboratories promote training in the theoretical and practical aspects of the profession, besides, we have an opportunity to confirm our theoretical knowledge during our training periods. We have our practical training on the best farms and at the best enterprises.

The graduates of our faculty work as mechanical engineers on different kinds of farms, such as dairy and beef fattening complexes, and at industrial enterprises. The best graduates are able to work as teachers at higher and technical schools, at research institutes and stations. So, today's mechanical engineers have good prospects of employment and career advancement here.

Do you know these words?

(Знаете ли вы эти слова?)

higher education establishment	[ˈhaɪə edjʊˈkeɪʃn ɪsˈtæblɪʃmənt]	*высшее учебное заведение*
mechanical engineer	[mɪˈkænɪkəl endʒɪˈnɪə]	*инженер-механик*
to realize	[ˈrɪəlaɪz]	*понимать, осознавать*
to be required	[biː rɪˈkwaɪəd]	*быть востребованным*
to value	[ˈvæljuː]	*ценить*
extremely	[ɪksˈtriːmlɪ]	*чрезвычайно*
diverse	[daɪˈvɜːs]	*разнообразный*
production	[prəˈdʌkʃn]	*производство*
failure	[ˈfeɪljə]	*неполадка, остановка или перерыв в действии*
malfunction	[mælˈfʌŋkʃn]	*неисправность*
loss	[lɒs]	*убыток*
demand	[dɪˈmɑːnd]	*спрос*
efficiency	[ɪˈfɪʃnsɪ]	*эффективность*
opportunity	[ɒpəˈtjuːnɪtɪ]	*возможность, перспектива*
to be at the	[dɪsˈpəʊzəl]	*быть в распоряжении*

disposal		
in accordance with	[ɪnəˈkɔːdənswɪð]	*в соответствии с*
properly	[ˈprɒpəlɪ]	*правильно, должным образом*
labour expenses	[ˈleɪbərɪkˈspensɪz]	*расходы на заработную плату*
all-round mechanization	[ɔːlraʊndmekənaɪˈzeɪʃn]	*комплексная механизация*
resistance	[rɪˈzɪstəns]	*сопротивление*
hydraulics	[haɪˈdrɒlɪks]	*гидравлика*
motorcar	[ˈməʊtəkɑːr]	*автомобиль*
animal breeding	[ˈænɪməl ˈbriːdɪŋ]	*животноводство*
well-equipped	[welɪˈkwɪpt]	*хорошо оснащенный*
fattening	[ˈfætnɪŋ]	*откорм*
enterprise	[ˈentəpraɪz]	*предприятие*
employment	[ɪmˈplɔɪmənt]	*трудоустройство*
career advancement	[kəˈrɪə ədˈvɑːnsmənt]	*карьерный рост*

1. Answer these questions:

(Ответьте на эти вопросы):

1. What is a profession?
2. Why did you choose engineering as a career?
3. What does the work of a mechanical engineer consist in?
4. What are mechanical engineers responsible for?
5. Why does this profession require high degree of education and training?
6. What machines does a mechanical engineer deal with?
7. Why is it necessary to organize failure-free operation and timely repair of the equipment?
8. What benefits does mechanization bring to people?
9. How can you acquire knowledge and skills necessary for the profession of a mechanical engineer?
10. Why is independent thinking so important for an engineer?
11. What career prospects are there for engineering graduates?

2. Match the antonyms from the columns.

(Соедините антонимы из колонок).

1. after	a. less
2. more	b. to continue
3. broad	c. before
4. to stop	d. to lower
5. loss	e. narrow
6. to raise	f. unemployment
7. theoretical	g. practical
8. employment	h. profit

3. Match the synonyms from the columns.

(Соедините синонимы из колонок).

1. prestigious	a. to understand
2. to require	b. prospect
3. failure	c. popular
4. opportunity	d. automobile
5. expenses	e. to demand
6. motorcar	f. employment
7. work	g. costs
8. to realise	h. malfunction

4. Match the words from the columns to make word combinations from the text.

(*Соедините слова из колонок, чтобы образовать словосочетания из текста).*

1. harvesting	a. clearly
2. prestigious	b. recommendations
3. scientific	c. machinery
4. fundamental	d. technology
5. mechanical	e. education
6. to realize	f. laboratories
7. caterpillar	g. knowledge
8. the latest	h. tasks
9. general	i. engineer
10. basic	j. tractor
11. well-equipped	k. grounding
12. theoretical	l. profession

5. Match the words with their definitions.

(Подберите к словам соответствующие определения).

1. engineer	a.	a strong request for something
2. employment	b.	a person who repairs and maintains machinery, motors, etc.
3. malfunction	c.	the degree to which a substance prevents the flow of an electric current through it
4. resistance	d.	the state of having paid work
5. career	e.	a failure to work or operate correctly
6. mechanic	f.	a job for which you are trained and in which it is possible to advance during your working life, so that you get greater responsibility and earn more money
7. opportunity	g.	the ratio of the useful work done by a machine, engine, device, etc, to the energy supplied to it, often expressed as a percentage
8. demand	h.	a person trained and skilled in the design, construction, and use of engines or machines, or in any of various branches of engineering
9. properly	i.	a situation in which it is possible for you to do something that you want to do
10. efficiency	j.	correctly, or in a satisfactory way

For your self-study

(Задания для самостоятельной работы)

6. Mark the sentences true (T) or false (F).

(Определите, верно или неверно утверждение).

1. The profession of a mechanical engineer requires high degree of education and training.
2. The work of a mechanical engineer doesn't have any influence on the cost of production.
3. The task of a mechanical engineer is to introduce all-round mechanization into all branches of agriculture.
4. The students of engineering faculty study special subjects after general engineering subjects.
5. 'Resistance of materials' is studied as one of general education subjects.
6. The ability to think independently is vital for a mechanical engineer.

7. The graduates of engineering faculty have their practical training on the best farms and at the best enterprises of the region.

7. Translate the sentences into Russian.

(Переведите предложения на русский язык).

1. James Dyson is arguably Britain's best-known design engineer of modern times.
2. Complex engine parts, machine parts can be drafted and designed by a mechanical engineer using a CAD system.
3. Being a mechanical engineer I have always been impressed with the quality and performance of STIHL engines and power tools.
4. The watch mechanism is extremely intricate and very difficult to repair.
5. Rudolf Diesel was an inventor and a mechanical engineer.
6. Effective measures were adopted for the production and supply of agricultural machinery, particularly tractors and combines, which helped relatively raise the quantity and quality of mechanization operations in the country.
7. Agricultural mechanization development is one of the indicators of the agricultural sector development in the country.

List of sources

Список источников

1. Английский язык для студентов автомобилестроительных специальностей средних профессиональных учебных заведений. Учеб. пособие / В.А. Шляхова. – М.: Высшая школа, 2021. – 120 с.: ил.
2. Книга для ежедневного чтения на английском языке / Сост. М.И. Дубровин. – М.: Новина, 2020. – 413 с.
3. Разговорный английский для всех: Тематический справочник / А.Н. Вонаков, О.Н. Мухачёва. – М.: Весь мир, 2021. – 528 с.
4. https://www.mechanicalbooster.com/2015/09/difference-between-petrol-and-diesel-engine.html
5. https://dictionary.cambridge.org
6. https://www.deere.com/common/docs/products/equipment/sprayers/5430i_series/brochure/YY0914703_E.pdf
7. https://s-english.ru/dialogi/at-the-car-servicu-station
8. https://www.esl-lab.com/difficult/car-repairs-script/
9. https://www.hobbyfarms.com/7-daily-tractor-maintenance-tasks-2/

Contents

Содержание