

МЕЖГОСУДАРСТВЕННОЕ ОБРАЗОВАТЕЛЬНОЕ УЧРЕЖДЕНИЕ
ВЫСШЕГО ОБРАЗОВАНИЯ
«БЕЛОРУССКО-РОССИЙСКИЙ УНИВЕРСИТЕТ»

Кафедра «Гуманитарные дисциплины»

АНГЛИЙСКИЙ ЯЗЫК

*Методические рекомендации к практическим занятиям
для студентов направления подготовки
23.03.02 «Наземные транспортно-технологические комплексы»
очной формы обучения*

**ЗАДАНИЯ ДЛЯ ОБУЧЕНИЯ ПРОФЕССИОНАЛЬНО
ОРИЕНТИРОВАННОМУ ЧТЕНИЮ
НА АНГЛИЙСКОМ ЯЗЫКЕ**



УДК 804.0
ББК 812.АНГ
А64

Рекомендовано к изданию
учебно-методическим отделом
Белорусско-Российского университета

Одобрено кафедрой «Гуманитарные дисциплины» «21» сентября 2020 г.,
протокол № 2

Составители: ст. преподаватель Е. В. Грицаева;
ст. преподаватель Ж. А. Полева

Рецензент ст. преподаватель Е. Н. Мельникова

Задания для обучения чтению профессионально ориентированных текстов на английском языке представляют собой часть единого учебно-методического комплекса для работы со студентами специальностей 23.03.02 «Наземные транспортно-технологические комплексы». Учебный материал и система упражнений направлены на развитие навыков ознакомительного и изучающего чтения, перевода, говорения и реферирования на английском языке. Задания могут использоваться для работы на аудиторных занятиях, а также для самостоятельной работы студента.

Учебно-методическое издание

АНГЛИЙСКИЙ ЯЗЫК

Ответственный за выпуск	С. Е. Макарова
Корректор	Т. А. Рыжикова
Компьютерная верстка	Н. П. Полевничая

Подписано в печать . Формат 60×84/16. Бумага офсетная. Гарнитура Таймс.
Печать трафаретная. Усл. печ. л. . Уч.-изд. л. . Тираж 26 экз. Заказ №

Издатель и полиграфическое исполнение:
Межгосударственное образовательное учреждение высшего образования
«Белорусско-Российский университет».

Свидетельство о государственной регистрации издателя,
изготовителя, распространителя печатных изданий
№ 1/156 от 07.03.2019.

Пр. Мира, 43, 212000, Могилев.

© Белорусско-Российский
университет, 2020

PART I

UNIT 1

Task 1. Read the text about different types of engines. Try to understand the meanings of the underlined words.

All motor vehicles have engines. There are two types of engines: **petrol engines** and **diesel engines**. The parts of an engine vary depending on the engine's type. There are spark plugs in all petrol engines. Diesel engines do not have spark plugs. They have **fuel injectors**. There are valves in **4-stroke diesel engines**. A 2-stroke petrol engine never has valves. There is no oil sump in a 2-stroke engine. There is oil in the fuel. A 4-stroke engine has an oil sump. There is no oil in the fuel.

For a four-stroke engine, key parts of the engine include the crankshaft, one or more camshafts and valves. For a two-stroke engine, there may simply be an **exhaust outlet** and **fuel inlet** instead of a valve system. In both types of engines, there are one or more cylinders and for each cylinder there is a spark plug, a piston and a crank. A **single sweep** of the cylinder by the piston in an upward or downward motion is known as a stroke and the downward stroke that occurs directly after the **air-fuel mix** in the cylinder is ignited (срабатывает) is known as a **power stroke**.

Task 2. Match a–j with 1–10.

- | | |
|-------------------------|---------------------------------|
| a) four-stroke engine | 1) цилиндр |
| b) cylinder | 2) клапан |
| c) piston | 3) четырёхтактный двигатель |
| d) valve | 4) поршень |
| e) four-cylinder engine | 5) масло |
| f) crankshaft | 6) распределительный вал |
| g) oil | 7) ход, такт |
| h) camshaft | 8) четырёхцилиндровый двигатель |
| i) stroke | 9) коленчатый вал |
| j) spark plug | 10) свеча зажигания |

Task 3. Match a–i with 1–9 to make up word combinations.

- | | |
|------------------|-------------|
| a) petrol | 1) stroke |
| b) motor | 2) engines |
| c) spark | 3) injector |
| d) fuel | 4) engine |
| e) oil | 5) plugs |
| f) exhaust | 6) engine |
| g) power | 7) vehicles |
| h) four-stroke | 8) outlet |
| i) four-cylinder | 9) sump |

Task 4. Explain the meanings of the underlined words from exercise 1.

Example: Petrol engines are engines which work on petrol.

UNIT 2

Task 1. Read the text attentively and try to understand the meaning of the underlined words and word combinations.

A motor vehicle is a complex engineering construction. It is composed of several thousand parts. The smaller parts are joined together and form larger components, or units. One of the main components of any vehicle is, of course, the engine.

In addition to the engine itself, there are four separate mechanisms, which are used to feed the engine. These mechanisms are the fuel system, the lubrication system, the electrical system and the cooling system.

The fuel system is a separate mechanism that is used for feeding the engine. The fuel system consists of a **tank**, a **fuel line** or a pipe, a pump and a carburettor. The engine produces power when air and fuel are mixed and burnt.

So let's have a look at the fuel system operation. The fuel is stored in a fuel tank. The fuel tank is connected to a fuel pipe. The fuel pipe carries the fuel to the fuel pump. This pump can be either electric or mechanic in operation. **Electric pumps** are generally situated near the fuel tank whereas a mechanical pump is generally located beside the engine. It is driven by the camshaft. The fuel pump is connected to the carburettor. In the carburettor the fuel is mixed with air. It is important to have the **right ratio** of air to fuel. For example, the optimum ratio of air to petrol in the fuel mixture is 15 parts of air to 1 part of petrol. The fuel and the air are compressed by the piston in the carburettor and they are drawn into the engine. In the engine the fuel and air are burnt and they produce power.

Task 2. Match a–g with 1–7.

- | | |
|---------------------------|--------------------------|
| a) the fuel system | 1) система смазки |
| b) the fuel tank | 2) топливопровод |
| c) the electrical system | 3) электрическая система |
| d) the fuel line | 4) топливный бак |
| e) the lubrication system | 5) система охлаждения |
| f) the cooling system | 6) карбюратор |
| g) the carburettor | 7) топливная система |

Task 3. Write down the words and word combinations which mean the same from the text.

consists of	besides	detached	is kept
proportion	the best	is connected to	
carries	is run	is placed	

Task 4. Make the questions to which the following words are the answers.

1. The fuel system, the lubrication system, the electrical system and the cooling system.
2. For feeding the engine.
3. In a fuel tank.
4. Beside the engine.
5. 15 parts of air to 1 part of petrol.
6. Either electronic or mechanic in operation.

UNIT 3

Task 1. Read the text below and say what the role of a sensor in automatic vehicle control is.

The basic elements that control vehicle motion have changed little in their concept over the past few decades. Vehicles are still driven by an internal combustion engine, steering is achieved by driving a mechanical gear and brakes are actuated by physically pumping hydraulic pistons. All these actions are carried out by the driver.

The status quo is ready for change. Under development are fast-reacting, intelligent systems that increase the possibility of automatic vehicle control.

In such vehicles the steering, accelerator (акселератор) and brake devices are connected to a sensor that monitors their position. The sensor passes this information as an electrical signal to the microprocessor controller.

The sensor information is processed and the actions for the steering, brakes and drive subsystems are calculated.

The outline of an automotive chassis differs from a conventional chassis as motion of each wheel is achieved by independent suspension, drive, brake and steering. The main control unit receives electrical signals from the steering wheel and pedals, and produces electrical signals that actuate the wheel motion systems.

In this design there is a possibility to modify the steering, brake and accelerator device. All these could be integrated into a single joy-stick. This possibility is a major advantage when we want to modify cars for the physically challenged.

Task 2. Find in the text the English equivalents to the following words.

Механическая передача, датчик, подсистема привода, шасси, независимая подвеска, рулевое колесо, педаль.

Task 3. Translate the following compound nouns into Russian.

the sensor information
the steering wheel
the wheel motion system)
the brake devices

the automotive chassis
the independent suspension
(подвеска)

Task 4. Match a–g with 1–7.

a) steering
b) advantage
c) independent suspension
d) internal combustion system
e) drive
f) fuel system
g) tank

1) привод
2) двигатель внутреннего сгорания
3) топливная система
4) независимая подвеска
5) бак
6) рулевое управление
7) достоинство, преимущество

Task 5. Answer the following questions.

1. What are vehicles driven by?
2. Who carries out all these actions?
3. What is under development now?
4. Do you think it's a good idea to develop automatic vehicle control?
5. Have the basic elements that control vehicle motion changed a lot over the past few decades?

Task 6. Say whether the following sentences are True or False.

1. Vehicles are driven by an internal combustion engine.
2. Brakes are actuated by physically pumping the wheels.
3. Fast-reacting, intelligent systems that increase the possibility of automatic vehicle control are under development now.
4. In vehicles with intelligent systems the steering and brake devices are connected to a sensor that changes their position.
5. A vehicle with intelligent systems is a major advantage when we want to modify cars for the physically challenged.

Task 7. Translate the words in brackets to complete the sentences.

1. Vehicles are driven (двигателем внутреннего сгорания).
2. These actions (выполняются) by the driver.
3. The intelligent systems (увеличивают) the possibility of automatic vehicle control.
4. The (датчик) passes the information to the microprocessor controller.
5. The sensor information (обрабатывается) there.
6. The control unit receives electrical signals from the (рулевое колесо).

UNIT 4

Task 1. Read the text and name the devices of the fuel system.

The function of the fuel system is to store and supply fuel to the cylinder chamber where it can be mixed with air, vaporized, and burned to produce energy. The fuel, which can be either gasoline or diesel is stored in a fuel tank. A fuel pump draws the fuel from the tank through fuel lines and delivers it through a fuel filter to either a carburettor or fuel injector, then to the cylinder chamber for combustion.

Tank location and design are always a compromise with available space. Most automobiles have a single tank located in the rear of the vehicle. All tanks have a fuel filler pipe, a fuel outlet line to the engine and a vent system. All fuel tanks must be vented.

Steel lines and flexible hoses carry the fuel from the tank to the engine. Two types of fuel pumps are used in automobiles: mechanical and electric. All fuel injected cars today use electric fuel pumps, while most cars with carburettors use mechanical fuel pumps.

Many cars today locate the fuel pump inside the fuel tank. While mechanical pumps operate on pressures of 4–6 psi (pounds per square inch), electric pumps can operate on pressures of 30–40 psi.

The fuel filter is the key to a properly functioning fuel delivery system. This is more true with fuel injection than with cars with carburettors. Fuel injectors are more susceptible to damage from dirt because of their close tolerances, but also fuel injected cars use electric fuel pumps. When the filter clogs, the electric fuel pump works so hard to push past the filter, that it burns itself up. Most cars use two filters. One inside the gas tank and one in a line to the fuel injectors or carburettor.

Task 2. Match a–e with 1–5 to make up the word combinations.

Механический насос, гибкие шланги, топливный фильтр, топливная смесь.

- | | |
|---------------|------------|
| a) fuel | 1) hoses |
| b) flexible | 2) mixture |
| c) fuel | 3) pump |
| d) mechanical | 4) filter |

Task 3. Put in prepositions where necessary.

1. A fuel pump draws the fuel ... the tank ... fuel lines ... a carburettor.
2. Fuel tanks are usually located ... the rear ... the vehicle.
3. The fuel system supplies fuel ... the cylinder chamber where it is mixed ... air.
4. Tank location is a compromise ... available space.

Task 4. Complete the sentences.

1. The function of the fuel system is
2. The fuel is stored in
3. All tanks have
4. Two types of fuel pumps are used in automobiles
5. Many cars today locate the fuel pump

UNIT 5

Task 1. Read the text. Choose the appropriate translation to the underlined words from the list below.

Car cooling system operation

The cooling system on modern liquid-cooled cars has a lot of plumbing. First, **the pump** sends the fluid into the engine block, where it makes its way through passages in the engine around the cylinders. Then it returns through the cylinder head of the engine. **The thermostat** is located where the fluid leaves the engine. The plumbing around the thermostat sends the fluid back to the pump directly if the thermostat is closed. If it is open, the fluid goes through the **radiator** first and then back to the pump. There is also a separate circuit for the **heating system**. This circuit takes fluid from the cylinder head and passes it through a heater core and then back to the pump. On cars with **automatic transmission**, there is normally also a separate circuit for cooling the transmission fluid **built into** the radiator. The oil from the transmission is pumped by the transmission through a second heat exchanger inside the radiator.

Радиатор, термостат, система охлаждения, насос, встроенный, автоматическая трансмиссия, система обогрева.

Task 2. Match a–g with 1–7 to make up word combinations.

- | | |
|------------------|-----------------|
| a) liquid-cooled | 1) exchanger |
| b) cooling | 2) transmission |
| c) engine | 3) cars |
| d) separate | 4) circuit |
| e) heating | 5) system |
| f) automatic | 6) system |
| g) heat | 7) block |

Task 3. Put in prepositions where necessary.

1. The pump sends the fluid ... the engine.
2. The liquid goes ... passages in the engine ... the cylinders.
3. There is a separate circuit ... the heating system.
4. A separate circuit for cooling the transmission is built ... the radiator.
5. The oil is pumped ... the transmission ... a heat exchanger.

UNIT 6

Task 1. Read the text and prove that the starting system proper operation is very important for the vehicle's work.

When talking about vehicles, especially when it is about the vehicle's power and performance, we often hear only about the powerful engines, stiff suspensions, and capable transmissions. This is particularly true if the main topic of the conversation is a luxury performance vehicle. Seldom we talk about the vehicle's starting system. It is another very important system that every vehicle is equipped with.

The vehicle's starting system is composed basically of two components: the electric starter motor (or starter) and the starter solenoid. As you turn the ignition key to the start position, the starter solenoid gets activated, which in turn energizes the starter motor. The starter motor would then spin the engine a few revolutions, allowing the combustion process to begin and the vehicle to start moving.

The main function of the vehicle's engine starting system is to induce the engine to start moving. But starting a cold engine requires a large amount of power and a large amount of electricity. In order for the starter motor to induce the engine to start spinning, it must overcome all the internal friction caused by the piston rings (поршневые кольца), the compression pressure in the engine cylinders, the energy needed to open and close the valves with the camshaft, and the power needed to start all the other components attached to the engine, like the water pump, oil pump and others. And because such power can only be brought by a large amount of electricity, the starter solenoid must be able to handle enormous current flows.

High performance vehicles (высокоэффективные транспортные средства) are equipped with high quality and high performance engine starting system

components that makes starting a cold engine smooth and easy. Eventually, though, these components may start to wear down with use and age. If this happens, you really would have to replace your starter motor and starter solenoid.

Task 2. Answer the questions.

1. What components is the vehicle's starting system composed of?
2. What is the main function of the vehicle's engine starting system?
3. Why does starting a cold engine require much power?
4. Why are high performance vehicles equipped with high quality engine starting system components?

Task 3. Complete the passage with the correct information.

The starter and starter solenoid are components of The starter solenoid must be able to handle enormous current flows because To make starting a cold system engine easy vehicles are equipped with If starting system components wear down, you have to

UNIT 7

Task 1. Read the text and try to understand the meanings of the underlined words.

The power train includes a manual or automatic transmission; a clutch, on cars with manual transmissions; a differential; **wheel axles**, and, in rear-drive cars, a **drive shaft**. While cars with a front engine, rear-drive layout were the norm for many years, most cars today are front-engine, front-drive. Front drive creates more passenger space and offers better traction on snowy or wet roads. Some cars and light trucks designed to go off-road or through bad weather use all-wheel drive, where all four wheels are coupled to the engine.

The power of the engine consists of torque and speed. Torque is the twisting force of the engine's crankshaft. Speed refers to the rate of rotation of the crankshaft.

Because of the great difference in engine speed and load between a car that is accelerating from a stop and one that is cruising at a steady speed, different **gear ratios** are needed to match engine output with the inertia of the vehicle.

The transmission can adjust the proportions of torque and speed that it delivers from the engine to the drive shaft. When it increases the torque, it decreases the speed; and when it increases the speed, it decreases the torque. Most automobile transmissions have between two and six gear ratios, along with a **reverse gear**. When the vehicle is started from rest, a high gear ratio is needed. As speed increases, lower gear ratios are selected.

Almost all transmissions vary torque and speed by means of gears. A gear is a wheel with projections called **teeth** around the edge. The teeth fit together with the

teeth of another gear. Suppose that a small gear with 12 teeth drives a large gear with 24 teeth. The large gear rotates with **half the speed**, but **twice the torque**, of the small gear. The amount of reduction is expressed numerically by the gear ratio. The gear ratio above is 2 to 1 because the small gear rotates twice for each rotation of the large gear.

The gears can be combined in different ways to produce various gear ratios and thus various proportions of torque and speed. The gear ratios are often called simply gear or speeds. The process of changing from one gear ratio to another is called **shifting gears**.

Task 2. Translate the following word combinations and phrases into Russian.

Accelerating from a stop, at a steady speed, different gear ratios, to match engine output with the inertia of the vehicle, to adjust the proportions of torque and speed, expressed numerically.

Task 3. Correct the wrong information in the phrases.

1. A wheel with teeth around the edge is called a ring.
2. The transmission can adjust the proportions of fuel and air.
3. Most automobile transmissions have ten gear ratios.
4. When the transmission increases the torque, it increases the speed.
5. The process of cruising at a steady speed is called shifting gears.

Task 4. Complete the sentences.

1. The power train consists of
2. Front drive cars offer ... on snowy or wet roads.
3. The transmission adjust the proportions of
4. Most automobile transmissions have
5. Transmissions vary torque and speed by
6. The process of changing from one gear to another is called

UNIT 8

Task 1. Read the text and learn the names of brake system components.

Your car brake system is a complex grouping of parts which serve a critical role in keeping you safe. No other system in the car is as important for your safety. Keeping your brake system in tip-top shape should be your top priority. Let's start with the pedal and work our way down the braking system to better understand how it works. The pedal is a strong steel lever which transmits the force from your foot to the master cylinder (главный цилиндр). The pedal typically has a switch attached to it, to turn on your brake lights when you press the pedal down.

When you push down on the pedal, the master cylinder is pushed via a push rod. When you step on the brake pedal, you are actually pushing against a plunger in the master cylinder which forces hydraulic oil (brake fluid) through a series of tubes and hoses to the braking unit at each wheel. Since hydraulic fluid (or any fluid for that matter) cannot be compressed, pushing fluid through a pipe is just like pushing a steel bar through a pipe. Unlike a steel bar, however, fluid can be directed through many twists and turns on its way to its destination, arriving with the exact same motion and pressure that it started with. It is very important that the fluid is pure liquid and that there are no air bubbles in it. Air can compress, which causes sponginess to the pedal and severely reduced braking efficiency. If air is suspected, then the system must be bled to remove the air. There are "bleeder screws" at each wheel cylinder and caliper for this purpose.

The master cylinder consists of a piston and a fluid reservoir. When the piston is moved, it pushes the brake fluid through the brake lines and into the caliper (суппорт) or wheel cylinder. Most cars have disc brakes on the front wheels, and many have disc brakes on the rear also. When disc brakes are not used on the rear, drum brakes are used. The fluid being pushed from the master cylinder through the brake lines pushes a piston in the brake caliper. This in turn applies force to the brake pads. The brake pads are typically made from a hard organic or metallic compound. The pads are made to survive under high heat and pressure. When the brake pads contact the disk rotor, there is friction and heat is created. This is how your car stops, by turning the rotating energy of your wheels into heat through friction. The last part of your braking system is the rotors. Typically made from cast iron and made heavy enough to dissipate heat and not warp over time. Unfortunately, in today's cars, many of the rotors are not large enough, and can warp within a few 1,000 miles. The rotor is bolted between the wheel and the spindle, and rotates at the same speed as the wheels.

Task 2. Give the English equivalents to the following words and word combinations.

Стальной рычаг, педаль, стоп-сигнал, главный цилиндр, плунжер, тормозная жидкость, стальной стержень, дисковые тормоза, барабанные тормоза, тормозной диск.

Task 3. Find in the text above the words opposite in meaning to the following words and word combinations.

Dangerous, in neglect state, worse, weak, depress, dirty fluid, front, soft compound, at a different speed.

Task 4. Complete the sentences.

1. The pedal transmits the force from the foot to
2. When you step on the brake pedal, you are pushing against a ... which forces
3. The master cylinder consists of a piston and a
4. On the rear wheels either ... brakes or ... brakes can be used.
5. When the brake pads contact the disc rotor

Task 5. Answer the questions.

1. What kinds of brakes are used in cars?
2. What liquid qualities make it possible to use it in the brake system?
3. Why air can't be used instead of liquid in the brake system?
4. What should you do if air is suspected in the brake system?
5. What materials are brake pads made of? And rotors?

UNIT 9

Task 1. Read the following text and fill in the gaps with the words below.

Finding a fault in a car

If your car doesn't ... in the morning, you should check three things first: the battery, the fuel ... and the spark It is easy to repair these If the battery is flat, you should ... it. If this doesn't work, you should ... it. If the petrol tank is empty, ... it up. If the spark plugs are dirty, ... them, and if the gap in a spark plug is too narrow or too wide, ... it to the correct width.

If your car doesn't start, the petrol pump may be ..., or the fuel pipe may be blocked. If the pump is broken, it must be ... or replaced. If the fuel pipe is blocked, take it off and unblock it.

If there is a loud CLICK! When you turn the key, the starter motor may be jammed. If it is, you can try to release it by pushing the car ... and backwards (in 2nd gear). If the car still doesn't start, the starter motor should be repaired or

Level, replace, plugs, adjust, forwards, faults, start, fill, clean, recharge, broken, repaired, replaced.

Task 2. Match a–l with 1–12.

- | | |
|--|---|
| a) The fuel tank leaks. | 1) Повышенный расход масла. |
| b) The engine gets overheated from time to time. | 2) В приёмной трубе (приемном коллекторе) дыра. |
| c) Abnormal oil consumption. | 3) Промойте радиатор струёй воды. |
| d) Intake manifold has a hole in it. | 4) Протекает бензобак. |
| e) Jacket water has frozen. | 5) Карбюратор нужно разобрать и почистить. |
| f) Flush the radiator. | 6) Время от времени двигатель перегревается. |
| g) The carburettor has to be dismantled and cleaned. | 7) Вода в охлаждающей рубашке замёрзла. |
| h) Blow through the fuel piping. | 8) Тормозная педаль запала. |
| i) The brake pedal has fallen through. | 9) Продуйте топливную магистраль. |
| j) Bleed the braking system. | 10) Отрегулируйте ручной тормоз. |
| k) Adjust the hand brake. | 11) Нет зажигания. |
| l) It doesn't ignite. | 12) Прокачайте тормозную систему. |

Task 3. Give the English equivalents to the following words and word combinations.

Бак протекает, двигатель перегревается, расход масла, приемная труба (приемный коллектор), вода в охлаждающей рубашке, продуть, педаль западает, отрегулировать.

Part II

Unit 1

Task 1. Read the text and say where the first cranes appeared.

Crane

A crane is a type of **machine**, generally equipped with a **hoist rope**, **wire ropes** or **chains**, and **sheaves**, that can be used both to lift and lower materials and to move them horizontally. It is mainly used for lifting heavy things and transporting them to other places. The device uses one or more **simple machines** to create **mechanical advantage** and thus move loads beyond the normal capability of a human. Cranes are commonly employed in the **transport** industry for the loading and unloading of freight, in the **construction** industry for the movement of materials, and in the manufacturing industry for the assembling of **heavy equipment**.

The first known crane machine was the **shadouf**, a water-lifting device that was invented in ancient **Mesopotamia** (modern Iraq) and then appeared in **ancient Egyptian technology**. Construction cranes later appeared in **ancient Greece**, where they were powered by men or animals (such as donkeys), and used for the construction of buildings. Larger cranes were later developed in the **Roman Empire**, employing the use of human **treadwheels**, permitting the lifting of heavier weights. In the **High Middle Ages**, harbour cranes were introduced to load and unload ships and assist with their construction — some were built into stone towers for extra strength and stability. The earliest cranes were constructed from wood, but **cast iron**, **iron** and **steel** took over with the coming of the **Industrial Revolution**.

For many centuries, power was supplied by the physical exertion of men or animals, although hoists in **watermills** and **windmills** could be driven by the harnessed natural power. The first mechanical power was provided by **steam engines**, the earliest **steam crane** being introduced in the 18th or 19th century, with many remaining in use well into the late 20th century. Modern cranes usually use **internal combustion engines** or **electric motors** and **hydraulic** systems to provide a much greater lifting capability than was previously possible, although manual cranes are still utilized where the provision of power would be uneconomic.

Cranes exist in an enormous variety of forms, each tailored to a specific use. Sizes range from the smallest jib cranes, used inside workshops, to the tallest tower cranes, used for constructing high buildings. Mini-cranes are also used for constructing high buildings, in order to facilitate constructions by reaching tight spaces. Finally, we can find larger floating cranes, generally used to build oil rigs and salvage sunken ships.

Task 2. Give the Russian equivalents to the following words and word combinations.

Equipped with a **hoist rope**, can be used both to lift and lower materials, move loads, for the assembling of **heavy equipment**, extra strength and stability, to provide a much greater lifting capability.

Task 3. Match a - f with 1- 6 to make up word combinations and translate them.

- | | |
|------------------------|---------------|
| a) water-lifting | 1) rope |
| b) <i>hoist</i> | 2) device |
| c) crane | 3) engines |
| d) <i>construction</i> | 4) industry |
| e) lifting | 5) machine |
| f) <u>steam</u> | 6) capability |

Task 4. Put questions to the underlined words and word combinations.

1. A crane is **a type of machine, generally equipped with a hoist rope, wire ropes or chains.**
2. It is used for **lifting heavy things and transporting them to other places.**
3. Cranes are commonly employed **in the transport industry.**
4. The first known crane machine was invented **in ancient Mesopotamia.**
5. The earliest cranes were constructed from **wood.**

Unit 2

Task 1. Read the text and say with what most larger cranes are equipped.

Truck-mounted Crane

The most basic **truck-mounted** crane configuration is a "boom truck", which features a rear-mounted rotating telescopic-boom crane mounted on a commercial truck chassis.

Larger, heavier duty, purpose-built "truck-mounted" cranes are constructed in two parts: the carrier, often called the lower, and the lifting component, which includes the boom, called the upper. These are mated together through a turntable, allowing the upper to swing from side to side. These modern hydraulic truck cranes are usually single-engine machines, with the same engine powering the undercarriage and the crane. The upper is usually powered via hydraulics run through the turntable from the pump mounted on the lower. In older model designs of hydraulic truck cranes, there were two engines. One in the lower pulled the crane down the road and ran a hydraulic pump for the outriggers and jacks. The one in the upper ran the upper

through a hydraulic pump of its own. Many older operators favor the two-engine system due to leaking seals in the turntable of aging newer design cranes. Hiab invented the world's first hydraulic truck mounted crane in 1947. The name, Hiab, comes from the commonly used abbreviation of Hydrauliska Industri AB, a company founded in Hudiksvall, Sweden 1944 by Eric Sundin, a ski manufacturer who saw a way to utilize a truck's engine to power loader cranes through the use of hydraulics.

Generally, these cranes are able to travel on highways, eliminating the need for special equipment to transport the crane unless weight or other size constrictions are in place such as local laws. If this is the case, most larger cranes are equipped with either special trailers to help spread the load over more axles or are able to disassemble to meet requirements. An example is counterweights. Often a crane will be followed by another truck hauling the counterweights that are removed for travel. In addition some cranes are able to remove the entire upper. However, this is usually only an issue in a large crane and mostly done with a conventional crane such as a Link-Belt HC-238. When working on the job site, outriggers are extended horizontally from the chassis then vertically to level and stabilize the crane while stationary and **hoisting**. Many truck cranes have slow-travelling capability (a few miles per hour) while suspending a load. Great care must be taken not to swing the load sideways from the direction of travel, as most anti-tipping stability then lies in the stiffness of the chassis suspension. Most cranes of this type also have moving counterweights for stabilization beyond that provided by the outriggers.

Task 2. Fill the missing words into the sentences.

capability, from side to side, counterweights, outriggers and jacks, hydraulic pump.

1. These are mated together through a turntable, allowing the upper to swing
2. One in the lower pulled the crane down the road and ran a hydraulic pump for the
3. Often a crane will be followed by another truck hauling the ... that are removed for travel.
4. Many truck cranes have slow-travelling ... (a few miles per hour) while suspending a load.
5. Most cranes of this type also have moving counterweights for stabilization beyond that provided by the... .

Task 3. Give the Russian equivalents to the following words and word combinations.

truck-mounted crane, boom truck, carrier, lifting component, turnable, single-engine machine, undercarriage, pump, due to, highway, eliminate, axle, disassemble, job site, outrigger, slowly-travelling capability, chassis suspension, stiffness.

Task 4. Say if the following is true or false. Correct the false sentences.

1. Larger, heavier duty, purpose-built "truck-mounted" cranes are constructed in three parts.
2. These modern hydraulic truck cranes are usually single-engine machines, with the same engine powering the undercarriage and the crane.
3. In older model designs of hydraulic truck cranes, there were four engines.
4. Many older operators favor the two-engine system due to leaking seals in the turntable of aging newer design cranes.
5. Most cranes of this type also have moving counterweights for stabilization beyond that provided by the outrigger.

Unit 3

Task 1. Read the text and say what the main advantage of a crawler crane is.

Types of Cranes

A **rough terrain crane** has a **boom** mounted on an **undercarriage** atop four rubber tires that is designed for **off-road** pick-and-carry operations. Outriggers are used to level and stabilize the crane for hoisting.

These telescopic cranes are single-engine machines, with the same engine powering the undercarriage and the crane, similar to a crawler crane. The engine is usually mounted in the undercarriage rather than in the upper, as with crawler crane. Most have 4 wheel drive and 4 wheel steering for traversing tighter and slicker terrain than a standard truck crane, with less site prep.

A **crawler crane** has its boom mounted on an undercarriage fitted with a set of **crawler tracks** that provide both stability and mobility. Crawler cranes range in lifting capacity from about 40 to 4,000 long tons (44.8 to 4,480.0 short tons; 40.6 to 4,064.2 t).

The main advantage of a crawler crane is its ready mobility and use, since the crane is able to operate on sites with minimal improvement and stable on its tracks without outriggers. Wide tracks spread the weight out over a great area and are far better than wheels at traversing soft ground without sinking in. A crawler crane is also capable of traveling with a load. Its main disadvantage is its weight, making it difficult and expensive to transport. Typically a large crawler must be disassembled at least into boom and cab and moved by trucks, rail cars or ships to its next location.

Floating cranes are used mainly in **bridge** building and **port** construction, but they are also used for occasional loading and unloading of especially heavy or awkward loads on and off ships. Some floating cranes are mounted on **pontoons**, others are specialized crane **barges** with a lifting capacity exceeding 10,000 **short tons** (8,929 **long tons**; 9,072 t) and have been used to transport entire bridge sections. Floating cranes have also been used to salvage sunken **ships**.

Crane vessels are often used in **offshore construction**. The largest revolving cranes can be found on **SSCV *Thialf***, which has two cranes with a capacity of **7,100 tonnes (7,826 short tons; 6,988 long tons)** each. For 50 years, the largest such crane was "**Herman the German**" at the **Long Beach Naval Shipyard**, one of three constructed by **Hitler's Germany** and captured in the war. The crane was sold to the **Panama Canal** in 1996 where it is now known as *Titan*.

Task 2. Complete the following sentences according to the text.

1. A rough terrain crane has a *boom* mounted on an *undercarriage* atop four rubber tires that is designed
2. Most have 4 wheel drive and 4 wheel steering for traversing tighter and slicker terrain
3. Typically a large crawler must be disassembled at least into boom and cab and moved by
4. Floating cranes have also been used
5. A crawler crane is also capable of

Task 3. Find the English equivalents for the following words and word combinations.

Гусеничный кран; стрела; кран повышенной проходимости; резиновые шины; грузоподъемность; гусеницы; полный привод; выносная стрела; плавкран; понтонный мост; спасение; морское строительство; поворотный кран.

Task 4. Put questions to the underlined words and word combinations.

1. These telescopic cranes **are single-engine machines**, with the same engine powering the undercarriage and the crane, similar to a crawler crane.
2. **Most have 4 wheel drive and 4 wheel steering** for traversing tighter and slicker terrain than a standard truck crane, with less site prep.
3. **The main advantage of a crawler crane** is its ready mobility and use, since the crane is able to operate on sites with minimal improvement and stable on its tracks without outriggers.
4. Floating cranes **are used mainly in bridge building and port construction**, but they are also used for occasional loading and unloading of especially heavy or awkward loads on and off ships.

Unit 4

Task 1. Read the text and say about the location of the crane operator.

Tower crane (I)

Tower cranes are a modern form of balance crane that consist of the same basic parts. Fixed to the ground on a concrete slab (and sometimes attached to the sides of structures), tower cranes often give the best combination of height and lifting capacity and are used in the construction of tall buildings. The base is then attached to the mast which gives the crane its height. Further, the mast is attached to the slewing unit (gear and motor) that allows the crane to rotate. On top of the slewing unit there are three main parts which are: the long horizontal jib (working arm), shorter counter-jib, and the operator's cab.

Optimization of tower crane location in the construction sites has an important effect on material transportation costs of a project.

The long horizontal jib is the part of the crane that carries the load. The counter-jib carries a counterweight, usually of concrete blocks, while the jib suspends the load to and from the center of the crane. The crane operator either sits in a cab at the top of the tower or controls the crane by radio remote control from the ground. In the first case the operator's cab is most usually located at the top of the tower attached to the turntable, but can be mounted on the jib, or partway down the tower. The lifting hook is operated by the crane operator using electric motors to manipulate wire rope cables through a system of sheaves. The hook is located on the long horizontal arm to lift the load which also contains its motor.

Task 2. Put questions to the underlined words and word combinations.

1. **Tower cranes** are a modern form of balance crane that consist of the same basic parts.
2. On top of the slewing unit there are **three main parts** which are: the long horizontal jib (working arm), shorter counter-jib, and the operator's cab.
3. **The long horizontal jib** is the part of the crane that carries the load.
4. The lifting hook is operated **by the crane operator** using electric motors to manipulate wire rope cables through a system of sheaves.
5. The hook is located **on the long horizontal arm** to lift the load which also contains its motor.

Task 3. Say if the following is true or false. Correct the false sentences.

1. The base is then attached to the mast which gives the crane its width.
2. On top of the slewing unit there are three main parts which are: the long horizontal jib (working arm), shorter counter-jib, and the operator's cab.
3. The long vertical jib is the part of the crane that carries the load.

4. The lifting hook is operated by the crane operator using electric motors to manipulate wire rope cables through a system of sheaves.

5. The hook is located on the long horizontal boom to lift the load which also contains its motor.

Task 4. Fill the missing words into the sentences.

hook, tower cranes, wire rope cables, mast, slewing unit.

1. are a modern form of balance crane that consist of the same basic parts.

2. The base is then attached to the ... which gives the crane its height.

3. On top of the ... there are three main parts which are: the long horizontal jib (working arm), shorter counter-jib, and the operator's cab.

4. The lifting hook is operated by the crane operator using electric motors to manipulate through a system of sheaves.

5. The ... is located on the long horizontal arm to lift the load which also contains its motor.

Unit 5

Task 1. Read the text and say about the function of the machinery arm.

Tower Crane (II)

Cranes can be found at construction sites around the world. Visit a site where they're building a tall tower, and you'd be most likely to find a tower crane.

Tower cranes stay in one place and lift large loads to great heights. Without them, it would be very difficult to lift heavy construction materials and equipment. Concrete and steel beams are much too heavy for construction workers to carry up stairs. Instead, they load these objects onto a crane and carefully put them in place.

The tall part of the crane that sticks up in the air is called the mast. It looks kind of like the mast on a **ship**! But instead of a flag or sail, this mast raises building materials. To do so, it must be supported by a large, heavy base. For example, the mast of a tower crane is usually bolted to a large concrete pad that can weigh as much as 400,000 pounds!

At the top of the mast, you'll find a gear and motor that allow the crane to rotate. You'll also find the working arm, machinery arm, and operator cab.

The working arm is called the jib. It's long and horizontal. The jib uses a trolley to help carry the load. The machinery arm is shorter than the jib. It contains the crane's motors, along with large concrete counterweights that help balance the load. Finally, the operator cab contains the electronic controls used to operate the crane.

Cranes combine **simple machines** to lift extremely heavy objects. In balance-style cranes, the crane's beam is balanced at a point, called the fulcrum. This allows it

to lift heavy objects with a relatively small force. In this way, the crane's beam acts as a simple lever. Cranes also make use of the pulley, another simple machine. Tower cranes often have more than one pulley. This helps it multiply its force to lift heavy objects.

Using the scientific principles behind simple machines, such as the lever and the pulley, cranes can multiply smaller forces to lift heavy loads to great heights. How heavy? It's not uncommon for large cranes to lift loads of nearly 40,000 pounds!

Task 2. Give the Russian equivalents to the following words and word combinations.

steel beams, building materials, concrete beams, working arm, machinery arm, jib, balance-style cranes, pulley, tower crane, heavy objects, multiply, great heights, lever, mast, trolley, balance-style crane, relatively small, lift, load.

Task 3. Fill the missing words into the sentences.

lever, jib, equipment, pulley, machinery arm, mast.

1. Tower cranes stay in one place and lift large loads to great heights. Without them, it would be very difficult to lift heavy construction materials and

2. The tall part of the crane that sticks up in the air is called the It looks kind of like the mast on a **ship**!

3. You'll also find the working arm, and operator cab.

4. The machinery arm is shorter than the

5. Tower cranes often have more than one

6. Using the scientific principles behind simple machines, such as the ... and the pulley, cranes can multiply smaller forces to lift heavy loads to great heights.

Task 4. Say if the following is true or false. Correct the false sentences.

1. Concrete and steel beams are much too heavy for construction workers to carry downstairs.

2. At the top of the mast, you'll find a gear and motor that allow the crane to rotate.

3. Finally, the operator cab contains the electronic controls used to monitor the crane.

4. Cranes combine **simple machines** to lift extremely heavy objects.

5. Using the scientific principles behind simple machines, such as the lever and the pulley, cranes can multiply smaller forces to lift heavy loads to great heights.

Unit 6

Task 1. Read the text and say where bridge cranes are used.

Bridge Crane

An **overhead crane**, also known as a bridge crane, is a type of crane where the hook-and-line mechanism runs along a horizontal beam that itself runs along two widely separated rails. Of ten it is in a long factory building and runs along rails along the building's two long walls. It is similar to a **gantry crane**. Overhead cranes typically consist of either a single beam or a double beam construction. These can be built using typical steel beams or a more complex box girder type. Pictured on the right is a single bridge box girder crane with the **hoist** and system operated with a control pendant. Double girder bridge are more typical when needing heavier capacity systems from 10 tons and above. The advantage of the box girder type configuration results in a system that has a lower deadweight yet a stronger overall system integrity. Also included would be a hoist to lift the items, the bridge, which spans the area covered by the crane, and a trolley to move along the bridge.

The most common overhead crane use is in the **steel industry**. At every step of the manufacturing process, until it leaves a factory as a finished product, **steel** is handled by an overhead crane. Raw materials are poured into a **furnace** by crane, hot steel is stored for cooling by an overhead crane, the finished coils are lifted and loaded onto **trucks** and **trains** by overhead crane, and the **fabricator** or stamper uses an overhead crane to handle the steel in his factory. The **automobile** industry uses overhead cranes for handling of raw materials. Smaller **workstation** cranes handle lighter loads in a work-area, such as **CNC** mill or saw.

Almost all paper mills use bridge cranes for regular maintenance requiring removal of heavy press rolls and other equipment. The bridge cranes are used in the initial construction of paper machines because they facilitate installation of the heavy cast iron paper drying drums and other massive equipment, some weighing as much as 70 tons.

In many instances the cost of a bridge crane can be largely offset with savings from not renting mobile cranes in the construction of a facility that uses a lot of heavy process equipment.

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

Мостовой кран, крюковый механизм, козловой кран, балочный кран, тяжелые прессовые валки, производственный процесс, сырье, печь, конечный продукт, облегчать, установка, чугун, сушильный барабан, тяжелое технологическое оборудование.

Task 3. Complete the sentences with a proper word/word combination.

1. An **overhead crane**, also known as a bridge crane, is
2. Overhead cranes typically consist of
3. At every step of the manufacturing process, until it leaves... .
4. The **automobile** industry uses overhead cranes for handling of
5. The bridge cranes are used in the initial construction of paper machines because they facilitate installation of

Task 4. Say if the following is true or false. Correct the false sentences.

1. An **overhead crane**, also known as a bridge crane, is a type of crane where the hook-and-line mechanism runs along a vertical beam that itself runs along two widely separated rails.
2. Overhead cranes typically consist of either a single beam or a double beam construction.
3. Also included would be a hoist to lift the items, the bridge, which spans the area covered by the crane, and a trolley to move along the bridge.
4. Smaller **workstation** cranes handle heavier loads in a work-area, such as CNC mill or saw.
5. In many instances the cost of a bridge crane can be largely offset with savings from not renting mobile cranes in the construction of a facility that uses a lot of heavy process equipment.

Unit 7

Task 1. Read the text and say what for carry deck cranes are used.

Carry Deck Cranes

Carry deck cranes are one of the premier options for many job sites. These cranes are extremely versatile in the tasks that they can accomplish. Ideal for lifting materials that require compact low profile cranes that can simultaneously maneuver in tight spaces while clearing overhead obstacles. Carry deck cranes typically come outfitted with fully hydraulic controls for extremely smooth and precise operations. With weight capacities upwards of 15 tons, and pick up and carry weight capacities of over 9 tons on certain models, you can imagine why carry deck cranes can be so useful on the job site.

So what are carry deck cranes used for? Being a smaller 4 wheel crane with a 360 degree rotating boom housed in the center of the deck, a carry deck crane has a wide variety of uses. Arguably its most important use is the ability to transport materials around the job site. With the smaller stature of the carry deck crane, they are easily able to hoist large amounts of material in tightly confined spaces. This

material can also be loaded onto the deck of the crane itself directly, and moved by the crane to another location on the job site. With its ability to navigate confined spaces, transport and hoist large amounts of material, and general ease of operation, a carry deck crane is a welcome addition on any job site.

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

Подъемный кран, чрезвычайно, универсальный, подъемный материал, компактный низкопрофильный кран, одновременно, препятствия над головой, экипированный, плавный, точный, грузоподъемность, стрела, загружать, перемещаться, замкнутое пространство, подъемник.

Task 3. Complete the sentences with a proper word/word combination.

1. Ideal for lifting materials that require compact low profile cranes that can
2. Carry deck cranes typically come outfitted with fully hydraulic controls for
3. Being a smaller 4 wheel crane with a 360 degree rotating boom housed in
4. With the smaller stature of the carry deck crane, they are easily able
5. With its ability to navigate confined spaces, transport and hoist large amounts of material, and general ease of operation, a carry deck crane

Task 4. Say if the following is true or false. Correct the false sentences.

1. These cranes are extremely versatile in the tasks that they can accomplish.
2. Ideal for lifting materials that require compact low profile cranes that can simultaneously maneuver in flat spaces while clearing overhead obstacles.
3. Being a smaller 4 wheel crane with a 180 degree rotating boom housed in the center of the deck, a carry deck crane has a wide variety of uses.
4. Arguably its most important use is the ability to transport materials around the job site.
5. With its ability to navigate confined spaces, transport and hoist large amounts of material, and general ease of operation, a carry deck crane is a welcome addition on any job site.

Unit 8

Task 1. Read the text and say what main parts of tower cranes are.

Components

Tower cranes are used extensively in construction and other industry to hoist and move materials. There are many types of tower cranes. Although they are different in type, the main parts are the same, as follows:

Mast: the main supporting tower of the crane. It is made of steel trussed sections that are connected together during installation.

Slewing unit: the slewing unit sits at the top of the mast. This is the engine that enables the crane to rotate.

Operating cabin: on most tower cranes the operating cabin sits just above the slewing unit. It contains the operating controls, load-movement indicator system (LMI), scale, anemometer, etc.

Jib: the jib, or operating arm, extends horizontally from the crane. A "luffing" jib is able to move up and down; a fixed jib has a rolling trolley that runs along the underside to move goods horizontally.

Counter jib: holds counterweights, hoist motor, hoist drum and the electronics.

Hoist winch: the hoist winch assembly consists of the hoist winch (motor, gearbox, hoist drum, hoist rope, and brakes), the hoist motor controller, and supporting components, such as the platform. Many tower cranes have transmissions with two or more speeds.

Hook: the hook (or hooks) is used to connect the material to the crane. It is suspended from the hoist rope either at the tip, for luffing jib cranes, or in the hoist rope belly underneath the trolley for hammerhead cranes.

Weights: Large, moveable concrete counterweights are mounted toward the rear of the counterdeck, to compensate for the weight of the goods lifted and keep the center of gravity over the supporting tower.

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

tower crane, supporting power, steel trussed sections, slewing unit, rotate, scale, jib, operating cabin, counter jib, hoist winch, hoist drum, transmission, hoist rope, counterdeck, gravity, gearbox, hoist motor, hammerhead crane, brakes, transmission, underneath.

Task 3. Say if the following is true or false. Correct the false sentences.

1. Tower cranes are used extensively in construction and other industry to hoist and move materials.

2. A "luffing" jib is able to move up and down; a fixed jib has a rolling trolley that runs along the underside to move goods vertically.

3. Many tower cranes have transmissions with three or more speeds.
4. It is suspended from the hoist rope either at the tip, for luffing jib cranes, or in the hoist rope belly underneath the trolley for hammerhead cranes.
5. Large, moveable concrete counterweights are mounted toward the rear of the counterdeck, to compensate for the weight of the goods lifted and keep the center of gravity over the supporting tower.

Task 4. Answer the questions.

1. Where are tower cranes used?
2. What is mast made of?
3. What does the operating cabin contain?
4. What is luffing jib able to do?
5. What does the hoist winch assembly consist of?
6. Where is the hook is used?

Unit 9

Task 1. Read the text and say what advantages electric-powered elevators have.

Elevator

An elevator is a platform, either open or enclosed, used for lifting people or freight to upper floors within a building. Elevators are a standard part of any tall commercial or residential building.

Manually operated elevators were used for lifting freight in warehouses and manufacturing plants as early as the 1600s. The first elevators were operated by steam power to turn the cable drums. In 1871, the first hydraulic elevators were introduced using water pressure as the source of power. At first the hydraulic rams were one-piece, which meant a hole had to be dug under the elevator shaft as deep as the elevator was to be high. Later multiple-section, telescoping hydraulic rams allowed shallower holes. In many cities hydraulic power for these early elevators was supplied by power companies which installed and maintained networks of hydraulic piping throughout the city. The first commercially successful electric elevator was installed in 1889, and electricity quickly became the accepted source of power.

Electric-powered elevators offered two significant advantages. First, electric power was clearly becoming universally available, and any building likely to be equipped with an elevator would also have electric power. Second, hydraulic elevators were severely limited in the height to which they could rise, while electric elevators, using a simple cable and pulley system, had virtually no height limit. For many years, electric elevators used either direct current (DC) motors or alternating current (AC) motors. Today, almost all elevators use one of two types of AC motors: the most common are geared motors for elevators moving at speeds up to 500 feet per

minute (153 m per minute), while direct-drive motors are used for elevators moving at higher speeds. Some modern high-speed elevators move at up to 2,000 feet per minute (610 m per minute).

Control systems on early elevators required human operators to regulate the speed of the lift and descent, to stop the elevator at each floor, and to open and close the doors.

Electric elevators are equipped with two primary safety mechanisms: a governor which controls the elevator's speed by controlling the speed of the cable pulleys, and the emergency brake which consists of jaws that grip the elevator guide rails in the event the cables break. Elevators also include electromechanical door interlocks to prevent the elevator from operating if the door is not completely closed and to protect passengers from being trapped by the closing door. The same door interlocks also prevent the outer doors on each floor from opening if the elevator is not present. Most elevators are equipped with a telephone, and sometimes a trap door in the ceiling, so that passengers can call for help or escape if an elevator becomes stuck between floors.

Task 2. Fill in the gaps with prepositions where necessary.

1. An elevator is a platform used ... lifting people or freight ... upper floors ... a building.
2. The first elevators were operated ... steam power to turn the cable drums.
3. Hydraulic elevators were severely limited ... the height.
4. Some modern high-speed elevators move ... up to 2,000 feet per minute.
5. Electric elevators are equipped ... two primary safety mechanisms.
6. The emergency brake consists ... jaws that grip the elevator guide rails ... the event the cables break.

Task 3. Choose the right form of the verb.

1. Manually operated elevators *used/were used* for lifting freight in warehouses and manufacturing plants.
2. The first elevators *were operated/operated* by steam power.
3. Hydraulic elevators *were limited/limited* in the height.
4. In many cities power companies *supplied/ was supplied* hydraulic power for these early elevators.
5. One of two types of AC motors *use/ is used* almost in all elevators.

Task 4. Say whether the following sentences are true or false.

1. The first elevators were operated by steam power to turn the cable drums.
2. The first commercially successful electric elevator was installed in 1871.
3. Electric-powered elevators offered three significant advantages.
4. Some modern high-speed elevators move at up to 500 feet per minute.
5. The same door interlocks also prevent the outer doors on each floor from opening if the elevator is not present.

Unit 10

Task 1. Read the text and make a list of words which are used to describe the design of elevators.

Design

Elevators themselves are simple devices, and the basic lifting systems have not changed much in over 50 years. The control systems, however, have changed substantially to improve safety and speed of operation. Elevators are designed for a specific building, taking into account such factors as the height of the building, the number of people traveling to each floor, and the expected periods of high usage.

Most elevators use counterweights which equal the weight of the elevator plus 40% of its maximum rated load. This counter-weight reduces the weight the motor must lift and ensures that the elevator cannot fall out of control while the cable is intact. In a lifting drum installation, a hoist cable runs down from a drive drum attached to the hoist motor, around a large pulley on the top of the elevator, up to a second pulley hanging from the roof of the elevator shaft, and down again to the counterweight. In a traction drum installation, the cable runs from the elevator, up and once around a drive drum attached to the hoist motor, then back to the counterweight. The elevator, called the car, and the counterweight each run in their own sets of guide rails. A second governor cable runs from the car up to a governor pulley, then down to a tension pulley at the bottom of the elevator shaft, and up to the car again. This cable rotates the governor pulley at a speed directly proportional to the speed of the car. In the event of excessive car speed, the governor uses another cable to activate the emergency brake jaws which grip the guide rails and slow the car to a stop.

A ramped bar on the side of the elevator shaft activates a series of switches on the outside of the car to slow and stop the car at the proper floor. As the car approaches the desired floor, the ramp activates the slow-down switch, which signals the hoist motor to reduce speed. When the car is aligned with the outer door opening, the ramp activates a limit switch to stop the car. If the door interlock switches also sense that the car is in the proper location, the electric door opening motor is activated to open both the inner car door and the outer floor door.

Task 2. Complete the sentences.

1. Elevators themselves are
2. Elevators are designed for
3. The counter-weight reduces
4. A hoist cable runs down
5. A second governor cable runs from
6. A ramped bar on the side of the elevator shaft activates
7. When the car is aligned with the outer door opening, the ramp

Task 3. Fill in the gaps with the words below.

Elevators themselves are simple Most elevators use counterweights which equal the weight of the elevator plus 40% of its maximum In ... hoist cable runs down from a drive drum attached to the hoist motor. In ..., the cable runs from the elevator. The elevator, called the ..., and the counterweight each run in their own sets of A second governor cable runs from the car up to ..., then down to ... at the bottom of the elevator shaft, and up to the car again. A ... on the side of the elevator shaft activates a series of switches on the outside of the car. The electric door opening motor is activated to open both the inner ... and the outer floor door.

a lifting drum installation, rated load, devices, car door, a tension pulley, ramped bar, a governor pulley, guide rails, a traction drum installation, car

Task 4. Make up questions to which the following words will be answers.

1. Simple devices.
2. In a lifting drum installation.
3. In a traction drum installation.
4. The governor pulley at a speed directly proportional to the speed of the car.
5. Activates a limit switch to stop the car.

Unit 11

Task 1. Read the text and tell about modern elevators.

Modern Elevators

Modern commercial buildings commonly have multiple elevators with a unified control system. The object of the control system is to minimize the average time any passenger spends from the time the elevator call button is pushed to the arrival of the first available elevator. Different systems use different levels of sophistication. The simplest systems use a single up and down button on each floor regardless of the number of elevators. When a passenger calls for an elevator, the controller sends the nearest elevator that is traveling in the desired direction. The approach of an elevator car is signaled by an illuminated arrow above the elevators doors pointing up or down.

In more sophisticated systems, the controller monitors the elevator call system for a set, or bank, of elevators operating side by side. The operation zone of these elevators is divided into sectors, with each sector being made up of adjacent floors. When a car has answered a call and completed the designated run, it becomes available to answer another call. At this point, depending on the controller's programming, the car may be returned to a designated "home" floor, or may be sent to the sector furthest from other operating or available cars to cover that sector. When

a call is received, the controller automatically compares the location of all the cars in the bank and sends the nearest one.

Controllers can also be programmed to respond differently at different times of the day. For example, the elevator controller in a busy office building will receive a preponderance of calls from the ground floor in the morning, when workers are arriving and need to go to their workplaces on the upper floors. In that case, the controller will be programmed to send all unassigned cars to the ground floor, rather than have them return to a home floor in their sector. Later in the day, a different set of instructions can be used to send unassigned elevators to different sectors, since passengers leaving the building will be much more evenly distributed among the floors than in the morning.

All modern elevators also have special override controls that firefighters can activate with a key to make elevators go directly to a specific floor without intermediate stops.

Task 2. Fill in the gaps with prepositions where necessary.

1. The simplest systems use a single ... and ... button on each floor regardless of the number of elevators.

2. When a passenger calls for an elevator, the controller sends the nearest elevator that is traveling ... the desired direction.

3. The operation zone of these elevators is divided ... sectors, with each sector being made up of adjacent floors.

4. Controllers can also be programmed to respond differently ... different times of the day.

5. A different set of instructions can be used to send unassigned elevators to different sectors, since passengers leaving the building will be much more evenly distributed ... the floors than in the morning.

Task 3. Mark the following sentences as True or False.

1. Modern commercial buildings commonly have multiple elevators with a unified control system.

2. The simplest systems use a single up and down button on the first floor regardless of the number of elevators.

3. The approach of an elevator car is signaled by an illuminated arrow above the elevators doors pointing up or down.

4. When a call is received, the controller automatically compares the location of all the cars in the bank and sends the nearest one.

5. Controllers can't be programmed to respond differently at different times of the day.

Unit 12

Task 1. Read the text and try to understand the meanings of the underlined words.

Raw Materials

The elevator car itself is constructed with a **steel framework** for durability and strength. A set of steel **beams** above the car, called the crosshead, span the **elevator shaft** from side to side and hold the pulley for the hoist cable. A steel structure, called **the sling**, extends down the sides of the car from the crosshead and cradles the floor, or platform. The sides of a passenger elevator car are usually made from steel sheet and are trimmed on the inside with decorative paneling. The floor of the car may be tiled or carpeted. **Handrails** and other interior trim may be made from stainless steel for appearance and wearability. A **suspended ceiling** is usually hung below the actual top of the car and may contain fluorescent lighting above plastic diffuser panels. The elevator controls, alarm buttons, and emergency telephone are contained behind panels in the front of the car, next to the doors.

Steel **guide rollers** or guide shoes are attached to the top and bottom of the sling structure on each side to run along the guide rails. The guide rails are also steel and are attached to the interior walls of the elevator shaft which runs from the top of the building to the bottom. The emergency brake mechanism consists of two **clamping faces** which can be driven together by a wedge to squeeze on the guide rail. The wedge is activated by a screw turned by a drum attached to the emergency cable.

Task 2. Correct the wrong information in the phrases.

1. A set of steel beams_ above the car, called the sling, span the elevator shaft from side to side and hold the pulley for the hoist cable.
2. A steel structure, called crosshead, extends down the sides of the car from the crosshead and cradles the floor, or platform.
3. The sides of a passenger elevator car are usually made from steel sheet and are trimmed on the outside with decorative paneling.
4. The elevator controls, alarm buttons, and emergency telephone are contained behind panels in the front of the car, next to the doors.
5. The emergency brake mechanism consists of four clamping faces which can be driven together by a wedge to squeeze on the guide rail.

Task 3. Complete the sentences.

1. A set of steel beams_ above the car span
2. A steel structure extends down
3. The floor of the car may be
4. Handrails and other interior trim may be made

5. Steel guide rollers or guide shoes are attached
6. The emergency brake mechanism consists of

Unit 13

Task 1. Read the text and give the appropriate translation for the following types of elevators.

Types of elevators

Passenger elevators – Designed to carry people between building floors. Their capacity is determined by the need of the specific building and it can vary between 5 and 25 people.

Express elevators – They do not service all floors, but instead only selected parts of the building. Most notably they move passengers from the building lobby to the top floor/sky lobby.

Urban transport elevators – They move passengers between several altitude portions, not inside a building but rather in open urban space. For example from bottom to the top of the hill.

Freight elevators – Intended for transport of goods. Their carrying load can vary between 2000 to 4500 kilograms. Most often their source of power are electric engines.

Stage elevators – They are often used in theaters to lift the entire stage filled with musicians and performers to the main level. They are often powered by hydraulics and their lift distance is limited to one or two building levels.

Vehicle elevators – They are used in to transfer cars in parking garages or manufacturing buildings. Some of them rotate during their ascent or descent to ensure that driver only needs to drive forward when exiting.

Boat elevators – In some smaller river sections canal crossings can be equipped with boat elevators that will lift entire sections of the water and bridge two differing water levels.

Aircraft elevators – Often used on aircraft carriers, they transport vehicles and goods from the internal hangars to the flight deck. They are designed to lift far greater weights than normal freight elevators, sometimes up to 90 tons.

Residential elevators – Used to transfer people inside one house or multistory mansion.

Elevators for handicapped people – Specially designed elevators that are used only for the people in wheelchairs.

Dumbwaiter – Small elevators that are used to transport food and other kitchen materials between several building levels. They are often used in hotels, restaurants and cruise ships.

Paternoster – Special kind of elevator that uses the principle of revolving cabins. On one rotating chain is set several traveling cabins that are in constant motion.

Scissor lift – This is a special kind of mobile elevator that is contracted for temporary access of people and equipment in inaccessible work areas (maintenance, construction).

Список литературы

1 **Шляхова, В. А.** Английский язык для автотранспортных специальностей: учебное пособие / В. А. Шляхова. – Санкт-Петербург: Лань, 2017. – 120 с.

2 **Герасимук, А. С.** Английский язык для специалистов автосервиса: учебное пособие / А. С. Герасимук. – 2-е изд., испр. – Минск: Вышэйшая школа, 2012. – 166 с.

3 Wikipedia, the free encyclopedia [Electronic resource]. – Mode of access: [https://en.wikipedia.org/wiki/Crane_\(machine\)](https://en.wikipedia.org/wiki/Crane_(machine)) - cite_note-50. – Date of access: 15.09.2020.