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ИНОСТРАННЫЙ ЯЗЫК

**ЭКСПЛУАТАЦИЯ ТРАНСПОРТНО-
ТЕХНОЛОГИЧЕСКИХ
МАШИН И КОМПЛЕКСОВ
(Автомобили и автомобильное хозяйство)**

FOREIGN LANGUAGE

**TRANSPORT AND TECHNOLOGICAL
MACHINES AND COMPLEXES OPERATION
(AUTOMOBILES AND AUTOMOTIVE
INDUSTRY)**

*Методические указания к самостоятельным работам
для студентов бакалавриата направления 23.03.03*

**САНКТ-ПЕТЕРБУРГ
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ИНОСТРАННЫЙ ЯЗЫК. Эксплуатация транспортно-технологических машин и комплексов (автомобили и автомобильное хозяйство): Методические указания к самостоятельным работам / Санкт-Петербургский горный университет. Сост.: *Е.В. Виноградова, Н.Э. Горохова*. СПб, 2023. 32 с.

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STEP 1.

Reading

1. Skim through the text and find which topic A-D it deals with. Pay attention to the words and phrases in bold.

- A Robotics and transport
- B The job of mechanical engineers
- C Employment opportunities in the automation field
- D Application of science to the physical world

Mechanical engineers design **assemblies** and systems to **accomplish** automated tasks. They are often hired to supervise a cell of machines in a manufacturing plant or **upgrade a production line**. Their job usually includes the use of design and software. Design processes will often involve timing charts to analyze machine movement and the relationships of components to each other.



Engineers also study **fluid flow** and **thermodynamics**. Cross-disciplinary training often includes some computer programming, electrical, industrial, and possibly chemical engineering classes. Engineers are involved with the specification of sensors and the effects of temperature or chemicals on different manufacturing processes. Specializations include robotics, transport and logistics, biomechanics, **vibration**, automotive engineering, and so on.

Knowledge of components such as motors, **bearings**, **linear actuators**, **gearing**, and various other elements is critical. The ability to specify, size framing, piping components and select **appropriate material** and components is an important skill. Engineers and designers rely heavily on the knowledge of a range of components.

(From 'Industrial automation hands-on' by Frank Lamb, p. 252)

2. Read the text again. Are the following sentences T (true) or F (false)? Underline the parts of the passage to prove the statements.

1. Mechanical engineers design systems to accomplish automated tasks.

2. Thermodynamics is the only scientific field that engineers study.
3. Awareness of motors, bearings, linear actuators, gearing, and various other components is crucial.
4. Robotics, transport and automotive engineering are key specializations.
5. Cross-disciplinary training always includes some computer programming and foreign languages.
6. One of the key skills is to be able to sort out proper material and units.

3. Read the text about an Indian British engineer and retell it.

MECHANICAL ENGINEERS

A **mechanical** engineer is a specialist in all fields **related** to **machines, kinematics, thermodynamics** and **tools**. One of the oldest **disciplines** of engineering, mechanical engineering is one of the largest producers of engineers around the world today, closely followed by **civil** and **aeronautical** engineers. Working as a mechanical engineer is known to be an **enriching** and **rewarding** experience and the job involves working to plan, build and examine **motor-powered vehicles, manufacturing** plants, airplanes, **industrial equipment, cybernetics** and much more.

Kumar is an Indian British engineer who started the Warwick Manufacturing Group (WMG), an academic department at the University of Warwick, which makes research, education and knowledge transfer in engineering, manufacturing and **technology**. He was made a **life peer** of the group in 2004, and works as a director in WMG. Born in Dhaka in British-India, he **displayed** a high level of **intelligence** from a young age and was brilliant in studies.

The son of a professor, he started his higher education at one of the **premier** institutions in India and then moved to Britain. He started working with Lucas Industries, the main **supplier** of parts to the British car and aerospace industries. He understood that the business **environment** in Britain was very **dynamic** and had a great respect for the hard-working British people. He finished his **doctorate** degree and became a **lecturer**. He understood the importance of **industrialization**. He started a manufacturing education programme for industry in Britain. He started Warwick Manufacturing Group with the help of **Vice-Chancellor**, Jack

Butterworth. He is also a **government adviser** and sits on the Labour seats in the House of Lords.

4. Find some additional information about Kumar and his manufacturing group on the Internet and make a short presentation.

 **Vocabulary**

1. Put the words in the correct order to make complete sentences.

1. a team of professionals / automobile production / specializing in / requires / specific aspects _____
2. these specializations include / aerodynamics / control systems / and emission control / fluid mechanics _____
3. a working knowledge of / technical experience is / technical aspects / of automobile maintenance _____
4. overlap / and tasks / some of these jobs _____
5. engineers / automotive technical performance / improve / and vehicle aesthetics _____

2. Complete the extract with the correct prepositions from the box.

<i>of</i>	<i>to</i>	<i>under</i>	<i>over</i>	<i>in</i>	<i>of</i>
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Engineering is a discipline that applies scientific knowledge ___ the fields of physics and chemistry, materials, mathematics, and logic to solve problems all ___ the world. Engineers use the tools they acquire in the study ___ scientific and mathematical principals to invent, design, and create physical solutions ___ problems.

The design and development ___ structures, machines, and processes require a full understanding of the materials and physics of the components and devices used. Behavior of machinery and processes must be forecast ___ all operating conditions. Personnel and equipment safety, the economics of designing, building and operating equipment, and ethical practice of the engineering profession are important elements while training engineers.

Grammar Review

1. Fill in the gaps with the correct forms of the words in brackets.

1. 'What ... (you, to read)?' 'It's an article about learning languages.
2. A lot of films ... (to make) in Hollywood.
3. We ... (to meet) 5 years ago. He offered ... (to help) me fix my car.
4. It ... (not, to rain). There isn't a cloud in the sky.
5. They ... (just, to offer) me a job.
6. She ... (not, to call) me back yet.
7. 'How long ... (he, to study) French?' 'About 2 years'.
8. 'Congratulations! ... (you, to accept) the offer yet?' 'Not yet.
9. I ... (to think) it's going to be a nice day.
10. When ... (the accident, to happen)?
11. She ... (to travel) to Central America on Sunday.
12. I ... (to help) if you like.
13. I have only ... (a few, few) friends therefore they are friends indeed.
14. My Mom ... (to think) about what to do at the weekend.
15. Wow, yes, I ... (to see) what you mean.
16. The house ... (to sell) for \$1 million.
17. You could afford to travel if you ... (to be) careful with your money.
18. I ... (to be) to Moscow twice.
19. My brother eats ... (a lot of/much).
20. I'm sure you ... (to learn) a lot when you go travelling.

2. Read the verbs and form the nouns.

To exploit, to provide, to explore, to produce, to manufacture, to specialise, to maintain, to perform, to improve, to present, to educate.

Verbs	Nouns
1. <i>to accomplish</i>	<i>accomplishment</i>
2.	

STEP 2.

Reading & Writing

1. Scan through the text and write a summary using the flow chart.

WHAT DOES AN AUTO ENGINEER DO?

The challenges facing personal mobility are endless. Automotive engineers work in every area of the industry, such as the look and feel of vehicles, and the safety and security of new forms of transport. While there is, of course, a focus to make cars reach high speeds, the modern day engineer needs to consider future sustainability and wider integration of advancing connected technologies. The work of an automotive engineer breaks down into three categories: design; research and development (R&D) and production.

To be a strong automotive engineer, you'll need technical experience and ability to work in a team. Moreover, automobiles are intricately designed, which requires engineers who can use deductive reasoning and creativity to solve the problem. To satisfy customers, engineers keep up to date with industry developments, regulations, and new technologies, so they have to be commercial aware. Due to the digitization of vehicles, auto engineering requires a high level of Maths and IT skills.



(<https://go.fisita.com/yfia/careers/what-does-an-automotive-engineer-do>)

Write about the challenges facing personal mobility, give examples.	
List some areas of the industry automotive engineers work in.	
Mention two things that a modern day engineer needs to consider.	
Say what categories an automotive engineering breaks down into.	
Point out the key skills of being a strong auto engineer.	
Make a conclusion of what you have read.	

2. Read and complete the text with the words in the box.

flexible manufacturing conditions assembling expenses
quality adjustments equipment FMS machines

FMS IN THE AUTOMOBILE INDUSTRY

The main goal of a (1) _____ manufacturing system is offering the speed needed to change quickly in accord with market (2) _____, but not sacrifice any (3) _____. Equipping production with a flexible manufacturing system may initially be more expensive than traditional equipment, but the overall goal of reducing (4) _____ can be achieved easier. Manufacturers are capable of saving money by using the same equipment for performing two or more functions.

One of the most common examples of a flexible manufacturing system can be seen in the (5) _____ of automobiles. Certain (6) _____ is used for attaching doors to a sedan. With just a few simple (7) _____, the same line and equipment may be used to attach doors to a sport utility vehicle or some other type of vehicle. In fact, the automobile industry keeps on saving a substantial amount of money using a (8) _____. Ford Motor Company, for example, estimated that it could save at least half of the cost of manufacturing updated models using flexible systems.

In some cases, the machines may not only be used for producing or (9) _____ parts for different models, but to make customizations. These customizations, without a flexible system in place, would take much longer and be much more expensive for the customer. Using (10) _____ with the ability to be flexible can not only speed the process up, but also can improve customer satisfaction by bringing down the price.

(From 'Учебник для технических вузов' by Т. Карпова, Т. Асламова)

3. Find the answers, and put them in the right order (1-5).

<i>Questions</i>	<i>Responses</i>
1. What is the aim of a flexible manufacturing system ?	A The organic mineral substances that can be utilized as fuels, such as coal, petroleum, natural gas
2. How can producers cut expenses and save money?	B Flexible manufacturing system.
3. What is the way to improve customer satisfaction ?	C To use machines with the ability to be flexible.
4. What company estimated that it could save the cost of manufacturing updated models?	D To offer the speed needed to change quickly in accord with market conditions keeping quality.
5. What does FMS stand for ?	E Ford Motor Company did.

4. Read and render the following text.

Автомобиль претерпел значительные изменения во многом благодаря развитию автомобильной промышленности. За каждой машиной, грузовиком, автобусом или байком на дорогах и в магазине стоит автомобильный инженер, сыгравший ключевую роль в их проектировании и строительстве. Из-за огромного количества автомобилей на дорогах сегодня автомобильная промышленность несет большую ответственность как за обеспечение безопасности этих транспортных средств, так и за их повышение эффективности. В автомобилестроении используются различные инженерные дисциплины, помогающие при проектировании и производстве любых видов транспортных средств, таких как автомобили и автобусы, велосипеды и грузовики. Так, например, один автомобильный инженер отвечает за работу над кузовом автомобиля, чтобы убедиться, что он имеет как можно более аэродинамические характеристики. Это приводит к максимальному увеличению производительности и гарантирует, что автомобиль потребляет как можно меньше топлива. В то время как другой работает над структурной целостностью транспортного средства,

Grammar Review

1. Read and translate the sentence. Do you see any difference in the word order? What do you know about *inversion*?

Rarely do these vehicles use diesel (['di:z(ə)l]).

2. Fill in the gaps with the correct forms of the words in brackets.

1. Kate wants to live in Germany, that's why she ... (to study) the German language this year.
2. Jane isn't here at the moment. She ... (to go) to the shop to buy a newspaper.
3. I saw you in the park yesterday morning. You ... (to sit) on the grass and ... (to read) a book.
4. The journey took a long time. There was ... (quantifiers) traffic.
5. The Panama Canal ... (to connect) the Atlantic and Pacific Oceans.
6. 'The sweater is too big for you'. 'I know. I ... (to give) it to my brother, he is much taller than me'.
7. Suddenly everybody stopped ... (to talk). There was silence.
8. How long ... (he/to save) money to go on a world trip?
9. If I see Sarah, I ... (to tell) her to call you.
10. The company is not independent. It ... (to own) by a larger company.
11. The roof of the building ... (to damage) in a storm a few days ago.
12. ... (you, modal verb of request) wait a moment, please?
13. 'Sing a song!' 'Which song shall I sing?' '... (quantifiers) song. I don't mind'.
14. 'Let's drive. It's ... (comparison, cheap)'.
15. Chris suggested ... (to go) to the cinema with his colleagues.
16. You were a little depressed yesterday but you look ... (comparison, good) today.
17. I don't think they ... (modal verb of advice) get married. They are too young.
18. If we ... (to catch) the 10.30 train, we'd arrive at the village too early.
19. 'Oh, I have left the door open'. 'Don't worry, I ... (to go) and shut it'.
20. It was nice to see Daniel again after such a long time. Actually, I ... (to see) him for 5 years.

STEP 3.

Reading

1. Skim through the extract and give the main idea of it.

The modern motor vehicle uses electronically controlled systems to operate many of the electrical items which were once controlled by simple

on/off switches. Lately, electronically controlled engine systems have become common to achieve good performance and acceptable emission levels. To operate such a motor car electrical power is needed. It comes from a generator which is driven from the engine. Since certain items may be needed when engine is not running, a battery or accumulator is fitted. The battery is charged by the generator when the engine is running.

2. Read two passages and match each sentence with its ending.

- 1 Trailers and semi-trailers are any non-self propelled vehicles. It is required that they should be towed by power-driven vehicles. Special purpose vehicles embrace the vehicles of categories 'M', 'N' or 'O' for the carriage of passengers or goods and for performing special functions with special body arrangement and equipment. They include motor caravans, armoured vehicles, ambulances, etc.
- 2 Off-road vehicles are considered to be any types of vehicles that are capable of driving on and off paved or gravel surface. They are generally characterized by having large tyres with deep open treads, a flexible suspension, or even caterpillar tracks. They have a versatile application, e.g. several types of motorsports involve racing off-road vehicles.

- | | |
|---|--------------------------------------|
| 1 Trailers are considered to be | A feature of off-road vehicles. |
| 2 Trailers are towed | B carrying passengers or goods. |
| 3 The vehicles of categories 'M', 'N' or 'O' are used for | C any non-self propelled conveyance. |
| 4 Ambulances or motor caravans | D by power-driven vehicles. |
| 5 Off-road vehicles | E perform special functions. |
| 6 All-round application is a key | F can drive off paved surface. |

3. Read the extract, and say ...

... if you think it is true – and if not, why not?

... why bulldozers belong to non-road mobile machinery

Agricultural and forestry tractors are power-driven vehicles, either wheeled or caterpillar tracks, which are designed to pull, push, carry or

actuate certain tools, machines or trailers. The term 'non-road mobile machinery' means any mobile machine, transportable industrial equipment or vehicle with or without body not intended for the use of passenger- or goods- transport on the road, in which the internal combustion engine is installed. Non-road mobile machinery embraces earthmoving machinery, such as scrapers, bulldozers, graders, excavators, etc.

 **Vocabulary**

Read about motor vehicles, and complete the passage with the words from the box.

carriage HGV truck large configuration bulky

Motor vehicles for the (1) _____ of goods include light commercial vehicles (also light goods vehicle) and (2) _____ goods vehicles, LGV (also heavy goods vehicle, (3) _____). 'A large goods vehicle' is the European Union (EU) term for any (4) _____ (lorry) with mass over 3.5 tones. Trucks vary greatly in size, power and (5) _____. Light commercial vehicles with mass not more than 3.5 tones are called light vans. When a vehicle is required for the transportation of (6) _____ equipment, a pickup would be often desirable.

 **Writing**

Translate the text into English using the correct verb forms.

1. Транспортные средства *делятся* на категории в соответствии с принятой классификацией. 2. Категория М *включает* механические транспортные средства, у которых не менее четырех колес; их используют для перевозки пассажиров. 3. *Существуют* многочисленные виды пассажирских транспортных средств: легковые автомобили, городские автобусы, автобусы дальнего следования и т.д. 4. В категорию Н *входят* механические транспортные средства, *имеющие* не менее четырех колес и *используемые* для перевозки грузов. 5. *Известно*, что механические транспортные средства для перевозки грузов *представлены* легкими грузовыми транспортными средствами и большими грузовыми транспортными средствами.

Grammar Review

Fill in the gaps with the correct forms of the words in brackets.

1. 'What ... (she, to write)?' 'It's an essay about animals. She likes it'.
2. Lots of cartoons ... (to make) in Hollywood last year.
3. We ... (to have) a meeting 2 years ago. He suggested ... (to help) me fix my car.
4. I ... (to suppose) it's going to be a nice day.
5. They ... (just, to make) an official proposal.
6. The building ... (already, to buy) for \$1 million.
7. 'How long ... (you, to teach) French?' 'About 3 years'.
8. 'Great! ... (has, to take) the offer yet?' 'Not yet. But I guess, he ... (to do) it soon'.
9. Let's walk! It ... (not, to drizzle). Look, there isn't any grey cloud in the sky.
10. When ... (the incident, to happen)?
11. She ... (to fly) to America next Monday.
12. I ... (to join) you if you want.
13. I have only ... (a few, few) university friends therefore they are friends indeed.
14. My parents ... (to think) about what to do at the weekend.
15. Wow, yes, I ... (to understand) only now what you mean.
16. My boss ... (not, to call) me back yet.
17. John could afford to go to the village if he ... (to be) free now.
18. I ... (to be) to Spain three times so far.
19. My brother isn't eating ... (a lot of/much) these days.
20. I'm sure you ... (to get) to know much as soon as you go travelling.

STEP 4.

 **Reading**

1. Skim through the extract and give the main idea of it.

2. Read the text again. Choose the correct heading for each paragraph A-E from the list of headings.

1. Paragraph A _____
2. Paragraph B _____



- 3. Paragraph C _____
- 4. Paragraph D _____
- 5. Paragraph E _____

A You can tell a lot from the tires. If the car has less than, say, 30,000 mile on the odometer, it should probably still have its original rubber. If a car with low miles on the odometer has new tires, be suspicious. Turn the front wheels all the way to the right or left, so you can get a good look at them. All four should be the same brand and size (except on a few performance cars, which use different sizes on the front and rear). If there is a mix of the brands or sizes on the car, ask why.

B Tread wear should be even across the width of the tread. It should also be the same on the left and right sides of the car. Ask if the tires have been rotated front-to- rear regularly. If not, the wear is usually more severe on the drive wheels. An aggressive driver tends to put heavy wear on the outside shoulder of the tire, at the edge of the sidewall. If the shoulder is badly worn, assume that the car has been driven hard.

C Check the tread depth, either with a tread-depth tool (available at auto-parts stores) or with a penny. To be legal, tires must have at least 1/16 inch of tread. If you don't have a tread gauge, insert a penny into the tread groove, with Lincoln's head down. If you can see the top of the head, the tire should be replaced.

D On each tire, lightly stroke the tread with the flat of your hand. If you feel raised areas, the tire was not aligned properly that symptom could point to a simple maladjustment or a costly suspension repair; have your mechanic check it out. Tires with that sort of wear will tend to make the steering wheel vibrate at highway speeds.

E Examine the sidewalls for scuffing, cracks, or bulges, and look on the edge of each rim for dents or cracks. A hard impact with a pothole or curb could have knocked a tire out of alignment or damaged a tire, rim, or suspension part.

Grammar Review

1. Put the nouns from the list below into the correct column.

Five hours, research, a couple of passengers, people, crossroads, time, the young, medium, team, curricula, mathematics, news, stairs

is → it	are → they	is / are → it / they
<i>money</i>	<i>premises</i>	<i>crew</i>

2. Complete the passage with the correct prepositions.


of	with	at	on	without
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Weight distribution depends ___ the location and size ___ the engine. The common practice of front-mounted engines exploits the stability that is more readily achieved ___ this layout. The development of aluminum engines and new manufacturing processes has, however, made it possible to locate the engine ___ the rear ___ necessarily compromising stability.

3. Fill in the gaps with the correct forms of the words in brackets.

1. 'Where are they?' 'They ... (still, to stand) in a queue in the hall'.
2. In fact, it ... (to take) me 2 hours to commute every day.
3. We ... (to book) online tickets yet. We ... (to do) it tomorrow.
4. Why are you so exhausted? ... (you, to take) an exam in Maths?
5. Tom and I ... (to use) to be very close, but recently we've grown apart.
6. Before we went to bed that night, we ... (to read) a scary story.
7. I woke up at night and saw that a figure ... (to stand) in the room.
8. I ... (to have) my hair cut next week.
9. When do you think we ... (to get) to the station?
10. What time ... (the exam, to start) tomorrow?
11. Nowadays a new remedy ... (to look for) in the whole world.
12. When he came, he saw that the door of his car ... (already, to unlock).
13. If I ... (to be) a magician, I could make people happy.
14. If you ... (not, to know) the answer, I will be able to explain it to you.
15. My friends suggest ... (to solve) this logical problem.
16. He will always remember ... (to travel) in Africa in his childhood.
17. I'd rather ... (not, to buy) this yellow hat.
18. I have ... (a little, little, few) time to get ready, but it's quite enough.

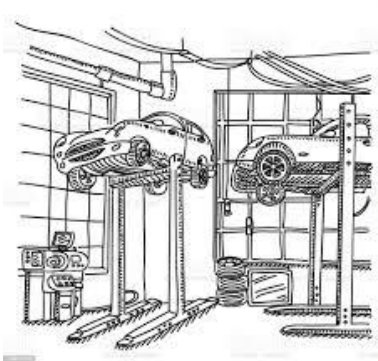
19. I don't see ... (much, many, little, few) people in the street.
20. What ... (he, to think) now? ... (he, to consider) going to the sea?

 **Reading & Writing**

1. Scan through the text and write a summary.

Car maintenance is usually scheduled according to different factors, such as the year or model of the car, its driving condition and driver behaviour.

When scheduling auto maintenance, car manufacturers recommend keeping in mind some factors that may affect the functionality of car subsystems. Some of these factors are: the number of trips and the distance travelled every day; the exposure to particular climate conditions (extreme hot or cold); long-distance cruising and whether the car has to tow a trailer or other heavy loads. Some tasks that



have equivalent service intervals can be combined into one single service known as a tune-up. In modern cars, where electronics control most of the car's functions, the traditional tune-up has been replaced by incorporated software that takes care of the engine by constantly checking thousands of sensor signals. Completed maintenance services are then recorded in a service book which is very useful for keeping track of the car service history.

STEP 5.

 **Reading**

1. Read and complete the text with the words in the box.

body	load-bearing	estate	elements	location
distinguish	shape	unitary	container	rear box

The main purpose of a motor car (1) _____ is to provide comfortable accommodation for a driver and passengers. With the introduction of (2) _____ constructions, the body has become the main structure onto which all other vehicle (3) _____ are attached. Therefore, the body is both a (4) _____ structure and a comfortable (5) _____ for the occupants. One can (6) _____ between some body types of a motor car, such as saloon, (7) _____, hatchback, coupe, convertible, etc.

Saloon is a fully enclosed body with either two or four passenger doors. The common (8) _____ of the saloon body is based on three 'boxes': the front box forms the engine compartment, the centre section is the (9) _____ for the occupants and the (10) _____ is a storage space, called a boot (trunk) for the luggage.

2. Read the text to check you answers of the exercise above.

The main purpose of a motor car body is to provide comfortable accommodation for a driver and passengers. With the introduction of unitary constructions, the body has become the main structure onto which all other vehicle elements are attached. Therefore, the body is both a load-bearing structure and a comfortable location for the occupants. One can distinguish between some body types of a motor car, such as saloon, estate, hatchback, coupe, convertible, etc.

Saloon is a fully enclosed body with either two or four passenger doors. The common shape of the saloon body is based on three 'boxes': the front box forms the engine compartment, the centre section is the container for the occupants and the rear box is a storage space, called a boot (trunk) for the luggage.

Grammar Review

1. Fill in the gaps with the correct forms of the words in brackets.

1. My friend ... (to look) for a job. He hopes to find a good one.

2. Oil prices ... (to increase) fast.
3. I ... (not, to work) at weekends.
4. He ... (to advise) me to eat more fruit.
5. How long ... (it, to take) you to get home from work?
6. Tom ... (to live) in France now. He ... (to like) it very much.
7. It's been 2 hours since she ... (to start) the meeting.
8. Is Peter at work this week? No, he ... (to have) a rest.
9. Your hands are dirty. What ... (you, to plant)? Flowers?
10. Now I ... (to want) a ... (clever, comparison) machine.
11. I ... (not, realize) what you are telling me.
12. I ... (to promise) I'll do the test ... (quickly, comparison).
13. What ... (your Mom, to do)? She is a teacher.
14. My ... (old, comparison) daughter ... (still, to study) at school.
15. For sure, many accidents ... (cause) **by** bad driving.
16. If you have ... (far, comparison) questions, ask me.
17. I ... (not, to know) where he lives. We ... (not, meet) for long.
18. We are working here until they ... (to come back).
19. Be quiet! The film ... (to watch) over there.
20. You ... (to stand) too close. Can you step ... (far, comparison).

2. Read the passage. What part of speech are the words in bold?

Vehicle design **depends** to a large extent on its intended use. Automobiles for off-road use must be **durable**, simple systems with high **resistance** to severe overloads and extremes in **operating** conditions. **Conversely**, products that are intended for **high-speed**, limited-access road systems **require** more passenger **comfort** options, **increased** engine performance, and optimized high-speed handling and vehicle stability. Stability depends on the distribution of weight **between** the front and rear wheels, the height of the centre of gravity and **its** position relative to the aerodynamic centre of **pressure** of the vehicle.

AUTOMOBILES IN FICTION



1. Read some extracts from “Oil” (1926), the story told as a third-person narrative about James Arnold, the son of the major oil industrialist.

Upton Sinclair (1878-1968) – an American writer, journalist, political activist who wrote nearly 100 books and other works in several genres. He is best known for his 1906 expose of the meatpacking industry, “The Jungle”. Sinclair was one of the best-educated American writers of his era.

2. Skim through the first extract and compare the original text with its Russian translation.

Fifty miles, said the **speedometer**; that was Dad’s rule for open country, and he never varied it, except in wet weather. Grades made no difference; the **fraction** of an **ounce** more **pressure** with his right foot, and the car raced on – up, up, up – until it topped the ridge, and was sailing down into the next little valley, exactly in the centre of the magic grey ribbon of **concrete**. The car would start to **gather** speed on the downgrade, and Dad would lift the pressure of his foot a trifle, and let

Спидометр показывал пятьдесят миль в час. Это была скорость, установленная мистером Россом для езды по открытой местности, и он изменял ее только в сырую погоду. Высота местности не влияла на нее. При каждом подъеме мистер Росс сильнее нажимал на педаль правой ногой, и машина устремлялась вверх, выше и выше, пока не достигала перевала, откуда неслась в следующую долину, все время держась в самом центре волшебной лен-

the resistance of the engine check the speed. Fifty miles was enough, said Dad; he was a man of order.

ты серого бетона; машина ускоряла ход, катясь вниз, и мистер Росс слегка ослаблял давление правой ноги, позволяя мотору сокращать скорость. «Пятьдесят миль в час достаточно», – говорил мистер Росс, а раз он что-либо решил, то следовал этому неизменно.

Vocabulary & Pronunciation

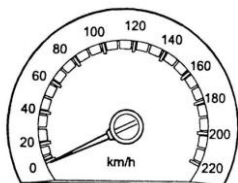
[spi(:)'domitə]
['fpreʃə]

['frækj(ə)n]
['kɔŋkri:t]

['auns]
['gæðə]

3. Read the second extract and get ready to discuss it.

Far ahead, over the tops of several waves of ground, another car was coming. A small black speck, it went down out of sight, and came up bigger; the next time it was bigger yet; the next time – it was on the



slope¹ above you, rushing at you, faster and faster, a mighty projectile hurled out of a six-foot cannon. Now came a moment to test the nerve of a motorist. The magic ribbon of concrete had no stretching powers. The ground at the sides had been prepared for **emergencies**², but you could not always be sure how well it

had been prepared, and if you went off at fifty miles an hour you would get disagreeable waverings of the wheels; you might find the neatly trimmed concrete raised several inches above the earth at the side of it, forcing you to run along on the earth until you could find a place to swing in again; there might be soft sand, which would **swerve**³ you this way and that, or wet clay which would **skid**⁴ you, and put a sudden end to your journey.

NOTES

- ¹ **slope** ['sləʊp] – подъем
- ² **emergency** [i'mɜ:dʒ(ə)nsi] – критическое положение; авария
- ³ **to swerve** ['swɜ:v] – изменять направление
- ⁴ **skid** ['skid] – тормозить

3. Scan through the passage taken from chapter III, describe the way the cars were going along the valleys and gorges.

Once more the valleys and gorges of Guadalupe Grade resounded to the flying echoes of honking horns. This time it was not one car, but a whole fleet of them, a dozen seven-ton trucks, broad and solid, with broad and solid double wheels, and trailers on behind, that carried even more tons. The first load towered high, a big stationary engine, held in place by heavy timbers bolted fast at the sides; that truck went carefully round the curves, you bet! Behind it came the 'mud-hogs' and the 'draw-works'; and then the 'string' of drilling tools, hollow tubes of the best steel, that were screwed end to end and went down into the earth, a mile or more, if need be. These tubes extended over the end of the trailers, where red flags waved in warning; on the short curves they swept the road, and if you met a car coming in the opposite direction, you had to



stop while the other car crept carefully by; if there was not room enough, the other car would have to back up to a place where the road was straighter. All this required continuous clamor of horns; you would have thought some huge flock of prehistoric birds – did the pterodactyls make noises? – had descended upon Guadalupe Pass, and were hopping along, crying: “Honk! Honk! Honk!” What they were really saying was: “Dad is waiting for us! Dad has signed his lease, and the derrick is under way, and his ‘rig’ must be on time! Clear the road!” Dad would not

trust to railroads for a rush job like this; they switched your stuff onto sidings, and you spent a week telephoning and interviewing dumb officials. But when you hired motor-trucks, you owned them for the time being, and they came right through.

There was insurance to cover all possible accidents – including the value of any man you might chance to send rolling down a mountain-side in a Ford car! So here came the dozen valiant tooters, toiling slowly up the grade, at far less than the ordained speed of fifteen miles per hour. Their radiators were hissing with steam, and every mile or so they would have to stop and cool off. But they got to the summit all right; and then came the slow crawl downwards, a man going ahead with a red flag, warning other cars into safe pockets on the road, to wait till the whole fleet had got by. So they got out of the pass, and onto the straight road, where they could go flying like any other cars; then it was a mighty roaring and a jolly sight. “Honk! Honk! Get out of the way! Dad is waiting!”

2. In the text find English equivalents for the following phrases.

Оглашались звуками автомобильных рожков; на поворотах; если дорога была чересчур узка; дюжина семитонных грузовиков; с широкими и массивными двойными колесами; трейлеры; с какой осторожностью двигался этот грузовик; сигнальные автомобильные рожки; множество гудящих автомобилей или грузовиков; радиаторы, свистя, выпускали пар.

3. Read the extract again and ask 10 questions on the text.

1. What covers all possible accidents on the road?
2. _____

4. Make up a plan of the story. Retell it in accordance with your plan.

Discussion Points

1. What is the moment to test the nerve of a motorist?
2. What are the key rules for safe driving that automobilists should follow every time when they sit in front of the wheel?

TEXTS FOR READING AND TRANSLATION

1

Mechanical Engineering

Engineers in this field design, test, build, and operate machinery of all types; they also work on a variety of manufactured goods and certain kinds of structures. The field is divided into machinery, mechanisms, materials, hydraulics, and pneumatics; and heat as applied to engines, work and energy, heating, ventilating, and air conditioning. The mechanical engineer, therefore, must be trained in mechanics, hydraulics, and thermodynamics and must know such subjects as metallurgy and machine design. They specialise in particular types of machines such as pumps or steam turbines. A mechanical engineer designs not only the machines that make products but the products themselves, and must design for both economy and efficiency. A typical example of mechanical engineering is the design of a car or an agricultural machine.

2

Electronic engineering

Electronic engineering deals with the research, design, integration, and application of circuits and devices used in the transmission and processing of information. Information is now generated, transmitted, received, and stored electronically on a scale unprecedented in history, and there is every indication that the explosive rate of growth in this field will continue unabated. Engineers design circuits to perform specific tasks, such as amplifying electronic signals, adding binary numbers, and demodulating radio signals to recover the information they carry. Circuits are also used to generate waveforms useful for synchronization and timing, as in television, and for correcting errors in digital information. The electronics revolution set the trend towards integrating electronic devices on a tiny chip of silicon.

3

Friction

Friction occurs to some degree in almost all situations involving physical objects. In many cases, such as in a running automobile engine, it hinders a process. Friction between the moving parts of an engine resists the engine's motion and turns energy into heat, reducing the engine's efficiency. Friction also makes it difficult to slide a heavy object, such as a refrigerator, along the ground. In other cases, friction is helpful. Between people's shoes and the ground it allows people to walk by pushing off the ground without slipping. On a slick surface, such as ice, shoes slip and slide instead of gripping because of the lack of friction, making walking difficult. It allows car tires to grip and roll along the road without skidding. Friction between nails and beams prevents the nails from sliding out and keeps buildings standing.

4

The reciprocating engine

The reciprocating engine consists of a series of pistons connected to a rotating crankshaft. As the pistons move up and down, the crankshaft rotates. The engine gets its name from the back-and-forth movement of its internal parts. The four-stroke engine is the most common type, and refers to the four different cycles the engine under goes to produce power. When the piston moves away from the cylinder head on the intake stroke, the intake valve opens and a mixture of fuel and air is drawn into the combustion chamber. As the cylinder moves back towards the cylinder head, the intake valve closes, and the fuel/air mixture is compressed. When compression is nearly complete, the spark plugs fire and the mixture is ignited to begin the power stroke. The expanding gases drive the piston away from the cylinder head, providing power to rotate the crankshaft.

5

The discovery of radioactivity

It was due more or less to an accident. Once in 1896, professor of physics Becquerel obtained a preparation of Uranium bisulphate for the purpose of studying the phosphorescence of this substance. But his inter-

ests were drawn in some other direction; he put the material into his table. It happened that in his table there was a box containing some unexposed photographic plates, the ampoule of uranium bisulphate fell right on top of that box, remaining there for several weeks. Intending to take some photographs, Becquerel opened the table, pushed aside the ampoule with the forgotten preparation; took out the box with the plates. But when he developed his photographs, he found that the plates were spoiled, as if they had been previously exposed to light. It was strange since the plates had been wrapped in thick black paper and never opened (852).

6

Mechanical properties of materials

Engineers must know how solid materials respond to external forces, such as tension, compression, torsion, bending, and shear. Solid materials respond to these forces by elastic deformation (that is, the material returns to its original size and form when the external force is lifted), permanent deformation, or fracture. Time-dependent effects of external forces are creep and fatigue, which are defined below. Tension is a pulling force that acts in one direction; an example is the force in a cable holding a weight. Under tension, a material usually stretches, returning to its original length if the force does not exceed the material's elastic limit. Under larger tensions, the material does not return completely to its original condition, and under even greater forces the material ruptures.

7

Automobile subsystems

An automobile has many subsystems. A car's transmission contains gears and other parts that transfer power from the engine to the axles and wheels. Most cars transfer power to the front wheels and are known as front-wheel drive cars. Some cars transfer power to the rear wheels or to all four wheels. They are called rear-wheel and four-wheel drive cars correspondingly. Besides the transmission and driving wheels, some subsystems include those that provide structure and support (frame), propulsion (engine), and guidance (steering wheel). Others are safety related (air bags). Some cars have mapping computers that connect to GPS satellites. Many of these subsystems are manufactured by outside suppliers. The anti-lock braking system (ABS), for example, is not usual-

ly made by the same company that makes the car. The CD player, tires, and windshield may also be manufactured by a different company.

READING TEST

1. Read the text and answer questions 1-18.

No matter how costly, hazardous, or polluting they are, nor how tedious it is to be stuck in traffic jams, cars are here to stay. In fact, the global car industry is worth a massive two trillion dollars a year. Recently, Guy Negre, a French engineer on Renault's Formula One engines, designed and produced the Airpod – a vehicle which runs on air, is lightweight and compact, and capable of reaching moderate speeds. Since the transport sector constitutes one seventh of all air pollution, Negre spent 15 years developing the Airpod, hoping to significantly reduce greenhouse-gas emissions. Petrol-electric hybrids, already on the market, are touted as being environmentally friendly, yet he says they are barely less polluting than combustion-engine vehicles. The Airpod, on the other hand, produces just 10% of the carbon monoxide of other cars.

Major manufacturers are now considering hydrogen as a power source for vehicles, but this technology may be decades away. Meantime, according to Negre, electric vehicles remain impractical: batteries are expensive, and need replacement within five years; recharging takes several hours.

Negre's secondary aim in creating the Airpod was to bring cars within reach of consumers in the developing world. To date, his most impressive deal has been with an Indian car manufacturer which predicts the Airpod will retail for the price of an average motorcycle. Currently, only three-wheeled Airpods are available, but Negre has a four-wheeled, five-door family saloon, plus vans, buses, taxis, boats, and aircraft on the drawing board.

So what is an Airpod? This small vehicle resembles an ordinary car except that it is made mostly from fiberglass – ten times as strong as steel but very light – meaning an Airpod weighs just 220 kilograms (484 lb). It has glass windows and an aluminium engine. However, it uses a joystick instead of a steering wheel, and it has backward-facing passenger seats and a front-opening door.

The 180cc engine of an Airpod allows it to reach a speed of around 70 kilometres per hour (kph) (43 mph), and it can drive for about 220 kilometres (137 miles) before refilling is necessary. It takes as little as 90 seconds to pump air into an Airpod from a high-speed compressor at a gas station, with air costing a mere 50 cents for a 220-kilometre journey. An on-board pump can refill the tank at home overnight.

How does an Airpod work? Quite simply: air is released through pistons in the engine, which drive the wheels. Compressed air tanks store up to 175 litres (46 gallons) of air at about 180 times the pressure of an average car tyre. Passengers and passers-by might have concerns about explosions with such pressure, but, in the rare event of one, the thermoplastic tanks split to release air, rather than shattering and exploding. In fact, the same tanks are already installed on natural-gas buses.

For longer journeys, there is a battery-assisted hybrid Airpod, which Negre maintains is capable of reaching 80 kph (50 mph) and travelling around 1500 kilometres (930 miles) on four litres of petrol, although this version has yet to be manufactured or tested.

Still in its infancy, the Airpod has both supporters and critics. Marcus Waardenberg, the organiser of an Airpod trial at a major Dutch airport, was impressed. 'The Airpods went over 40 kph (25 mph), were quiet and manoeuvrable. Refilling was fast and straightforward.' As a result, his company is replacing its fleet of electric service vehicles with Airpods. Perhaps more significantly, AK Jagadeesh, from the Indian conglomerate, Tata, signed a \$60-million deal. 'We're going to use Airpod technology in Tata's Nano car,' he said.

Ulf Bossel, a sustainable energy consultant, commented that the Airpod easily reaches speeds of over 50 kph (31 mph). 'Initially, it could capture the second-car market. Then, there are those older people who can no longer afford conventional cars.' Both Europe and North America have ageing populations.

Bill Robertson, a motoring journalist, noted that the Airpod would suit large numbers of people who make two or three trips a day of fewer than ten kilometers, or who live in distant suburbs of big cities where public transport is poor. If the Airpod looked a little sexier, there would be the potential for it to make inroads into the golf buggy sector, which currently uses electric vehicles.

Among the detractors of the Airpod is the former champion racer, Martella Valentina, who would prefer a vehicle with a more robust engine. 'There are so many aggressive drivers out there,' she said. 'As a woman, I don't feel safe in an Airpod.' She added, 'Refilling overnight is a drag.'

The automotive engineer, Hamid Khan, concurs, expressing skepticism about sufficient energy storage under reasonable pressure to drive the car any distance, let alone the alleged 220 kilometres (135 miles) before refill. He insists this is unconfirmed by independent tests. Stopping and starting in typical city conditions would also lower the range even further, and more distressingly, safety data is lacking for crash testing. 'Negre claims fiberglass is stronger than steel, but the Airpod looks as though it would crumple under the wheels of a normal saloon,' commented Khan.

Nevertheless, Negre has signed deals to manufacture his car in the US, Latin America, India, and several European countries. Compressed air may no longer take a back seat to other power sources, and it is even conceivable that one day we may be flying in aircraft that fly on air.

Questions 1-8

2. Complete the summary using the list of words, A-O, below.

The (1) ____ of combustion-engine cars continues (2) ____ there being problems with them. According to Negre, an automotive engineer and inventor, a(n) (3) ____, a petrol-electric car, is really not much less (4) ____ . Negre believes his Airpod is far cleaner and cheaper, and will (5) ____ drivers in the developing world in particular.

An Airpod is lighter than other cars at only (6) ____ kilograms. The highest confirmed speed it can reach is around (7) ____ kph. It can be refilled fast at a service station or more slowly at home. Some people may be worried about the high-pressure gas stored on board an Airpod, but its tanks are safe and already in (8) ____ on public buses.

A exist

D 80

G 70

B popular

E benefit

H polluted

C polluting

F although

I alternate

J alternative
M popularity

K 220
N 180

L use
O despite

Questions 9-13

3. Look at the following statements and the list of people below. Match each statement with the correct person: A, B, C, or D. Write the correct letter, A, B, C, or D.

9 ___ He claims the hybrid Airpod can travel 1500 kilometres on four litres of petrol.

10 ___ He imagines the Airpod will appeal to the elderly.

11 ___ He doesn't think the Airpod will compete with golf buggies unless it changes its appearance.

12 ___ He doesn't believe the Airpod can drive as far as its creator maintains.

13 ___ He has agreed to the manufacture of the Airpod in a number of countries.

List of people

A Bill Robertson

B Guy Negre

C Hamid Khan

D Ulf Bossel

Questions 13-18

4. Find the words in the text that fit the descriptions in 13-18.

13 _____ a material made from small threads of glass twisted together, pressed into hard plastic; considered to be stronger than steel.

14 _____ a long line of vehicles that cannot move forward or have to move very slowly because the road is blocked by something.

15 _____ not harmful to the natural world.

16 _____ a trial that helps to identify how a vehicle will perform during an accident.

17 _____ a thick piece of rubber that is fitted onto the wheels of vehicles such as cars, buses, and bicycles.

18 _____ a large flat board on which paper may be spread for designers to work on.

APPENDIX

1. Learn how to pronounce the following symbols in English.

Symbol	Examples	Meaning in full
.	2.15	two point one five
+	$a + b$	a plus b
-	$a - b$	a minus b
=	$N = 54$	N equals fifty four
x	2×5	two multiplied by five / two times five
:	6: 2	six divided by two
%	7%	seven per cent
>	> 5	greater than five
<	< 10	less than ten
\leq	≤ 3	less than or equal to three
\geq	≥ 3	greater than or equal to three
$\sqrt{\quad}$	$\sqrt{10}$	the square root of ten
$N^{2,3,4}$	2^3	two to the power of three
{ }		curly brackets
[]		square brackets
()		round brackets
∞	$A \propto B$	a is proportional to b

БИБЛИОГРАФИЧЕСКИЙ СПИСОК

1. *Антонова Ю.В.* Иностранный язык: сборник технических текстов с заданиями для специальности «Автомеханик» / Ю.В. Антонова. Новокузнецк: ГОУ СПО Проф. колледж, 2011. 33 с.
2. *Карпова Т.А.* Английский язык для технических вузов: Учебник / Т.А. Карпова, Т.В. Асламова, Е.С. Закирова, П.А. Красавин; под общ. ред. А.В. Николаенко. М.: КНОРУС, 2014. 352 с.
3. *Лионел К.* Англо-русский толковый словарь / Керман Лионел. М.: Теа, 1996. 309 с.
4. *Мюллер В.К.* Англо-русский и русско-английский словарь: 150000 слов и выражений / В.К. Мюллер. М.: Эксмо, 2009. 1200 с.
5. Black M., Sharp W. Objectives IELTS. Intermediate / Michael Black, Wendy Sharp. Cambridge University Press, 2011. 144 p.
6. *Lamb F.* Industrial Automation Hands-on / Frank Lamb. McGraw-Hill Education; 2013. 369 p.
7. *Sopranzi S.* Flash on English for mechanics, electronics, and technical assistance. / Sabrina Sopranzi. ESP Series, 2012. 50 с.
8. *Sinclar U.* Oil / Upton Sinclar, Penguin Random House, 2003. 345 p.
9. A comprehension guide to car engine and performance [Электронный ресурс]: <https://axleandchassis.com/auto-engines-and-performance/> (дата обращения 20.01.2021).
10. Automobile written by Ken W. Purdy [Электронный ресурс]: <https://www.britannica.com/technology/automobile> (дата обращения 18.01.2021).
11. *Синклер У.* Нефть. Глава первая. Поездка [Электронный ресурс]: <https://librebook.me/oil/vol2/1> (дата обращения 21.01.2021).

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**ИНОСТРАННЫЙ ЯЗЫК
ЭКСПЛУАТАЦИЯ ТРАНСПОРТНО-ТЕХНОЛОГИЧЕСКИХ
МАШИН И КОМПЛЕКСОВ
(Автомобили и автомобильное хозяйство)**

**FOREIGN LANGUAGE
TRANSPORT AND TECHNOLOGICAL MACHINES
AND COMPLEXES OPERATION
(AUTOMOBILES AND AUTOMOTIVE INDUSTRY)**

*Методические указания к самостоятельным работам
для студентов бакалавриата направления 23.03.03*

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