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ПРАКТИКУМ ПО ОБУЧЕНИЮ ЧТЕНИЮ И УСТНОЙ РЕЧИ ПО ТЕМЕ “АВТОМОБИЛЬ” НА АНГЛИЙСКОМ ЯЗЫКЕ

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ПРАКТИКУМ ПО ОБУЧЕНИЮ ЧТЕНИЮ И УСТНОЙ РЕЧИ ПО ТЕМЕ "АВТОМОБИЛЬ" НА АНГЛИЙСКОМ ЯЗЫКЕ в двух частях ЧАСТЬ I для студентов I курса. / Владим. гос. ун-т; Владимир, 2005, 62с.

Практикум включает учебные тексты на английском языке по теме "Автомобиль" и упражнения к ним. Предназначен для развития навыков чтения и устной речи на английском языке по избранной специальности. Практику обеспечивает накопление лексического запаса и усвоения грамматического материала, определенного программой по иностранному языку в неязыковом вузе.

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Предисловие

Настоящий практикум предназначен для студентов I курса факультета "Автомобильный транспорт". Практикум составлен в соответствии с требованиями программы по иностранным языкам для неязыковых вузов и рассчитан на 100-110 часов учебного времени, т. е. на I-II семестр при 3 часах аудиторных занятий в неделю.

Цель практикума – развитие навыков чтения специальной литературы и развитие навыков устной речи по темам, предусмотренным программой для первого курса. Практикум включает 7 разделов (Units), состоящих из основного и дополнительного текста, каждый из которых имеет свою методическую задачу, и многочисленных грамматических и лексических упражнений. Большинство текстов взято из оригинальной английской литературы по специальности. Тексты подвергались некоторым сокращениям.

Основной текст **A** предназначен для изучения выделенного лексико-грамматического материала. После каждого основного текста приводится лексика, подлежащая активному усвоению.

В каждом задании активизируется определенное грамматическое явление в предтекстовых и послетекстовых упражнениях. Упражнения составлены на базе лексики предшествующих текстов, что обеспечивает ее повторение.

Дополнительные тексты **B** тематически связаны с текстами **A** и нацелены на понимание основного содержания, что проявляется с помощью тестовых заданий.

UNIT I. THE RUSSIAN MOTOR INDUSTRY

Упражнение 1. ***Скажите следующие предложения в прошедшем или будущем времени (Future Indefinite, Past Indefinite), добавив соответствующие обстоятельства времени, если это необходимо (last year, yesterday, some years ago, tomorrow, next year, in some years).***

1. I am a student. 2. The students are at the University. 3. We are pupils. 4. The pupils are at school. 5. He is in the garden. 6. Our town is small. 7. We are in the classroom. 8. We are at the English lesson. 9. This girl is an engineer. 10. The question is difficult. 11. The book is interesting. 12. The workers are at the factory.

Упражнение 2. ***Выразите несогласие со следующими утверждениями.***

Образец: He is a first year student. No, he is not a first year student.

1. They were at the factory yesterday. 2. She will be at the University tomorrow. 3. The students are at the lesson of physics now. 4. You will be an engineer in three years. 5. The exercise was very difficult. 6. This river is long. 7. The story was interesting. 8. The library is far from your house. 9. I shall be at home on Saturday. 10. He is in the library now. 11. The car is old.

Упражнение 3. ***Скажите следующие предложения в прошедшем (Past Indefinite) и будущем времени (Future Indefinite).***

1. He has a car. 2. I have a dictionary. 3. She has many friends. 4. We have a new flat. 5. They have many books in their library. 6. The students have classes in the morning. 7. They have English lessons twice (дважды) a week. 8. They have no classes on Sunday. 9. The students have vacation in winter and in summer. 10. We have a television-set in our room.

Упражнение 4. ***Ответьте на следующие вопросы.***

1. Are there many students at your University? 2. Are there many Universities in your town? 3. How many Universities are there in your town? 4. Are there many schools in your town? 5. Are there many classrooms in the University? 6. How many windows are there in your classroom? 7. Is there an opera theatre in your town? 8. How many students were there at the English lesson yesterday? 9. Is there a teacher in the classroom? 10. How many seasons are there in a year? 11. Are there seven days in a week? 12. How many minutes are there in an hour?

Упражнение 5. ***Выразите согласие или несогласие со следующими утверждениями, употребляя фразы:***

That's right. That's wrong. As far as I know.

Образец: A: There are two theatres in our town. B: That's right, there are two theatres in our town. C: That's wrong, there is only one theatre in our town.

1. There are many new streets in our town. 2. There were many schools and Universities in the town of Vladimir in 1920. 3. There is a museum in the town. 4. There are no factories in our town. 5. There is an opera theatre in the town of Vladimir. 6. There were many factories in the town in 1920. 7. There will be a new school in a new district (район) of the town. 8. There are many cars and buses in our town. 9. There are many faculties at the Vladimir State University. 10. There is no skating-rink in our town.

Упражнение 6. ***Прочитайте по-английски следующие числа:***

1, 10, 110; 2, 12, 20, 120; 3, 13, 30, 133; 4, 14, 40; 5, 15, 50; 6, 16, 60, 666; 7, 17, 70; 8, 18, 80; 9, 19, 90; 123; 547; 7.894; 1/2; 1.3; 1/4; 3/4; 2/3; 0.1; 0.01.

<u>Упражнение 7.</u> Прочитайте по-английски следующие обозначения дат:

11.2.1976; 13.1.1941; 9.5.1945; 7.10.1917; 1.1.1977; 22.4.1870; 8.3.1924; 5.12.1936; 21.7.2003.

Text 1A

The Russian Motor Industry

Motor transport plays an important part in the life of the country. Every day it carries millions of passengers and a great amount of loads.

It is enough to say that every day more than 35 million people travel by bus only. Russia with its vast territory and high level of production requires constant increase in the output of motor vehicles.

The Russian motor industry is one of the leading industries in the country. Until 1924 Russia had no motor industry at all. The motor industry began to develop in the country in the thirties of the 20th century. Ten AMO-F-15 lorries were the first motor vehicles produced in Russia. It was in 1924. At that time (1924-1931), there were only three plants producing vehicles. Now there are tens of enterprises producing many types of lorries, cars, buses, engines and their parts.

Great tasks face the Russian motor industry. In the future the output of motor vehicles will be greatly increased. Their quality will be higher. There is no doubt that they will have greater speeds, will be more economic, more reliable, more comfortable and non-polluting.

Active Vocabulary

1. after - после
2. amount - количество
3. to carry - возить, перевозить

4.	comfortable	-	удобный, комфортабельный
5.	constant	-	постоянный
6.	to develop	-	развивать
7.	dozen	-	множество
8.	engine	-	двигатель
9.	enough	-	достаточно
10.	enterprise	-	предприятие
11.	every	-	каждый
12.	to face	-	стоять перед
13.	important	-	важный
14.	to increase	-	возрастать, увеличивать(ся)
15.	industry	-	промышленность
16.	motor industry	-	автомобильная промышленность
17.	level	-	уровень
18.	leading	-	ведущий
19.	load	-	груз
20.	lorry	-	грузовик
21.	only	-	только
22.	output	-	выпуск
23.	passenger	-	пассажир
24.	plant	-	завод
25.	to play part	-	играть роль
26.	to pollute	-	загрязнять
27.	to produce	-	производить, вырабатывать
28.	production	-	производство
29.	quality	-	качество
30.	reliable	-	надежный

31. to require - требовать
32. speed - скорость
33. task - задача
34. time - время
35. vast - громадный, обширный
36. motor vehicle - автомобиль
37. there is no doubt - нет сомнения

Упражнение 8. ***Поставьте вопросы к подчеркнутым словам или словосочетаниям.***

1. There were many passengers in the bus. 2. There are many enterprises in Russia. 3. There ware five passengers in the car. 4. There is a bus stop not far from the University. 5. There will be a new motor plant in this town.

Упражнение 9. ***Измените следующие предложения, используя глаголы have, has, had вместо оборота There + to be.***

Образец: There was no motor industry in the 18th century Russia.

The 18th century Russia had no motor industry.

1. There are different parts in a motor vehicle. 2. There is an engine in every motor vehicle. 3. There are five seats in this car. 4. There are many lorries and some cars on this collective farm. 5. There are many books in the library of this University. 6. There are many faculties at the University.

Упражнение 10. ***Дайте возможные сочетания следующих прилагательных и существительных.***

Every, great, small, high, vast, constant, leading, comfortable.

Industry, increase, task, car, level, territory, output, amount, speed, day.

Упражнение 11. ***Найдите в тексте английские эквиваленты следующих словосочетаний.***

Играть важную роль, достаточно сказать, высокий уровень производства, выпуск автомобилей, десятки предприятий, большие задачи, нет сомнения, миллионы пассажиров, автомобильный транспорт.

Упражнение 12. ***Переведите следующие словосочетания, обращая внимание на существительные в роли определений.***

Motor transport, car output, production level, engine parts, motor vehicle parts, lorry speed, motor industry, motor vehicle production, car production, output increase, motor industry tasks.

Упражнение 13. ***Вставьте одно из трех слов, подходящее по смыслу.***

1. Motor transport plays an (interesting, important, good) part in the life of the country. 2. Russia has a (small, different, vast) territory. 3. The Russian industry (takes, gives, requires) many motor vehicles. 4. The output of motor vehicles in Russia (continues, increases, produces), constantly. 5. In Russia there are dozens of (institutes, schools, plants) producing engines and motor vehicles. 6. Great tasks (face, stand, begin) the Russian motor industry. 7. Russian motor plants produce a great amount of (boxes, tables, motor vehicles) every year. 8. In the future motor vehicles will be more (reliable, beautiful, different). 9. Lorries carry a great amount of (people, passengers, loads) every day.

Упражнение 14. ***Ответьте на вопросы по тексту 1А.***

1. Does motor transport play an important part in the life of the country? 2. What industry is one of the leading industries of the country? 3. What do millions of motor vehicles carry every day? 4. Does the output of motor vehicles constantly increase in Russia? 5. Why does Russia require many motor vehicles? 6. Was there motor industry in the 19th century Russia? 7. When did

the industry begin to develop? 8. When were the first motor vehicles produced? 9. Are there many enterprises producing motor vehicles and engines in Russia?

Text 1B

Задание 1. ***Прочтите следующие интернациональные слова и переведите их.***

Economy, engineer, diesel, mass, mechanization, model, organization, process, technology, specialization.

Задание 2. ***Прочтите следующие слова, обращая внимание на их значение. Знание этих слов поможет Вам понять содержание текста.***

1.	To follow	-	следовать
2.	heavy-duty lorry	-	грузовой автомобиль большой грузоподъёмности
3.	improvement	-	совершенствование
4.	to meet the needs	-	удовлетворять потребности
5.	to pay attention	-	уделять внимание
6.	to reach	-	достигать
7.	sharp	-	резкий
8.	to surpass	-	превосходить
9.	to take part	-	принимать участие
10.	works	-	завод

Задание 3. ***Прочтите текст, стараясь понять основное содержание.***

Development of Russian Motor Industry

On November 7, 1924 the first lorries produced at the AMO Works (now the I.A. Likhachev Motor Works) took part in the parade in Moscow. That was the beginning of the Russian Motor Industry.

A year later the first 3-ton lorries were made at the Yaroslavl Motor Works. In 1931 only 4,500 vehicles were produced. This was not enough. The task was to get mass production of motor vehicles.

In the years that followed there was a sharp increase in the output of motor vehicles. The AMO Works in Moscow were rebuilt to produce 25,000 lorries a year. New Motor Works were built in Nizhny Novgorod. In January 1932 it began to produce lorries and a little later cars. In 1936 our country was the first in Europe and the second in the world in the production of lorries.

The highly developed motor industry played an important part in war time. During the Great Patriotic War our plants produced GAZ-MM and ZIS-5 lorries for the army and for the economy. ZIS-5 lorries were very reliable on the wartime roads.

After the war the pre-war level of the motor industry was not only reached but surpassed in 1949. Many new plants producing lorries, bases, cars, engines were built and many old plants were rebuilt. Much attention was paid to the improvement of production processes, to the automation and mechanization of production, to specialization. The Yaroslavl Works, for example, produced engines only, specialized enterprises in Poltava, Grodno, Frunze and some others produced parts.

In 1970 the Volzhsky Car Works produced the first cars, comfortable "Zhiguli". This is a model enterprise for technology and organization.

Another giant-the KamAz in the town of Naberezhny Chelny was built to produce heavy-duty lorries and diesel engines.

Great successes of the motor industry are the result of hard work of scientists, engineers, workers who do all they can to meet the country's and the people's needs for modern motor vehicles.

<u>Задание 4.</u> Выберите утверждения, соответствующие содержанию текста.

1. The first Russian motor vehicles were produced a) at the AMO works; b) at the Yaroslavl Motor Works; c) at the Nizhny Novgorod Motor Works. 2. The Nizhny Novgorod Motor Works began to produce motor vehicles in a) 1930; b) 1932; c) 1940. 3. In 1936 the country which was the first in Europe in the production of lorries was a) Great Britain; b) France; c) Russia. 4. The pre-war level of production of motor vehicles in Russia was surpassed in

a) 1949; b) 1960; c) 1965. 5. The Volzhsky Motor Works produce a) heavyduty lorries; b) cars; c) engines.

Задание 5. ***Определите, есть ли в тексте ответы на следующие вопросы. Ответьте на эти вопросы.***

1. What task faced the Russian motor industry in the thirties? 2. What plant was built in the town of Naberezhny Chelny to produce heavy-duty lorries? 3. How many lorries are produced at the KamAz each year? 4. When did the Volzhsky Car Works produce the first cars? 5. What cars do the Volzhsky Car Works produce? 6.What is the main task of the Russian motor industry now? 7. What place does Russia take in the world in the production of cars now?

Задание 6. ***Закончите данные предложения в соответствии с содержанием текста.***

1. During the Great Patriotic War the motor industry produced . . . .2. Now much attention is paid to the improvement of . . . . 3. There are many specialized enterprises in Russia, for example in . . . . 4. Great successes of the motor industry are the result of hard work of . . . . 5. The task of the Russian motor industry is to meet the needs of the country for . . . .

UNIT II. THE MAIN COMPONENTS OF A MOTOR VEHICLE

Упражнение 1. ***Скажите следующие предложения в единственном числе.***

1. My friends usually get up at 7 o'clock. 2. They live in a hostel (общежитие). 3. They live far from the University. 4. They go to the University by trolleybus. 5. They come to the University ten minutes before the beginning of the lectures. 6. My friends usually prepare for their classes in the reading room. 7. They take all books from the University library. 8. They come home in the evening. 9. They like to listen to music in the evening.

<u>Упражнение 2.</u> Составьте вопросы, ответами на которые были бы следующие предложения.

Образец: Yes, he does. He lives in a hostel.

Вопрос: Does he live in a hostel?

No, they don't. They don't go to the University by bus.

Вопрос: Do they go to the University by bus?

1. Yes, we do. We study at the Vladimir State University. 2. No, he does not. 3. My brother doesn't study at the University. 3. Yes, he does. He works at the plant. 4. Yes, they do. Classes usually begin at 9 o'clock. 5. No, she doesn't. She does not go to the University on Sunday. 6. Yes, we do. We usually go to the cinema on Sunday. 7. Yes, I do. I do my homework in the evening. 8. No, they don't. They don't study in July. 9. No, he doesn't. My friend doesn't play football. 10. No, we don't know the name of this student.

<u>Упражнение 3.</u> Ответьте на вопросы, используя слова, данные в скобках.

Образец: Do you study at school? (at the University)

No, I don't. I study at the University.

1. Do you study German? (English). 2. Does your friend live in the hostel? (with his parents). 3. Do you read newspapers in the morning? (in the evening). 4. Does your sister live in Kiev? (in Minsk). 5. Does she work as an engineer? (as a teacher). 6. Do they work at the plant? (on the collective farm). 7. Does he play volley-ball? (hockey). 8. Does he live far form the University? (not far form the University). 9. Does it take you half an hour to get to the University? (fifteen minutes). 10. Does it take them little time to prepare for their English lesson? (much time).

<u>Упражнение 4.</u> Поставьте глаголы, данные в скобках, в будущем времени.

1. This plant (to begin) producing lorries in two years. 2. In some years the economy of the country (to require) more motor vehicles than it requires now. 3. Next year our plant (to increase) the output of engines and their parts. 4. Next summer I (to travel) by car. 5. I (to see) many places of interest. 6. Tomorrow they (to go) to see their friend who is ill. 7. We (to study) English next year.

8. Tomorrow the students (to work) in the English laboratory. 9. I (to help) you in your work. 10. Tomorrow the lecture (to begin) at 6 o'clock in the evening.

<u>Упражнение 5.</u> Переведите следующие интернациональные слова.
Component, chassis, system, construction, text.

Text 2A

The Main Components of a Motor Vehicle

The main components of modern motor vehicles are the power unit, the chassis and the body. The power unit is the source of power that makes the wheels rotate and the vehicle move. The most convenient source of power for driving vehicles is the internal combustion engine. The chassis includes the power train, the running system, the steering system and the brake system. The power train transmits the power from the engine to the wheels and consists of the clutch, the gearbox, the propeller shaft and other members. The running system consists of the frame with axles, wheels and the suspension system. The frame of the motor vehicle supports the engine, the power train members and the body. However, for most light cars and buses the frameless construction is now used. In this case the body is made so stiff that it replaces the frame. All the units such as engine, power train members are attached to the body. The main purpose of the body is to protect the driver and passengers from wind, dust, cold and rain. In the texts that will follow we shall consider the main components of the motor vehicle in more detail.

Active Vocabulary

1.	all	-	все
2.	to attach	-	крепить, прикреплять
3.	axle	-	ось, мост
4.	body	-	кузов
5.	chassis	-	шасси
6.	clutch	-	сцепление
7.	component	-	компонент
8.	to consider	-	рассматривать
9.	to consist (of)	-	состоять из
10.	frameless construction	-	конструкция с несущим кузовом

11. convenient - удобный, подходящий
12. to drive - приводить в движение
13. driver - водитель, шофер
14. dust - пыль
15. internal combustion engine - двигатель внутреннего сгорания
16. to follow - следовать
17. frame - рама
18. gearbox - коробка передач
19. however - однако
20. to include - включать, содержать в себе
21. member - часть
22. main - главный, основной
23. to make - заставлять, побуждать
24. to move - двигать(ся), передвигать(ся)
25. other - другой
26. power - мощность
27. to protect - защищать
28. purpose - цель
29. to replace - заменять, замещать
30. to rotate - вращаться
31. source - источник
32. stiff - жёсткий
33. such as - как например, такой как
34. to support - поддерживать
35. brake system - тормозная система
36. running system - ходовая часть
37. steering system - система рулевого управления
38. suspension system - система подвески
39. propeller shaft - карданный вал
40. power train - силовая передача
41. to transmit - передавать
42. unit - блок, узел
43. power unit - силовой агрегат
44. to use - использовать, употреблять

45. wheel - колесо
46. in this case - в этом случае
47. in detail - обстоятельно, детально

Упражнение 6. ***Образуйте прилагательные с помощью суффикса –less от следующих существительных и переведите их.***

help – помощь – helpless (беспомощный), smoke – дым – smokeless, frame – рама – frameless, end – конец – endless, use – польза – useless, count – счет – countless.

Упражнение 7. ***Переведите следующие предложения, обращая внимание на подчеркнутые прилагательные.***

1. There are countless types of cars on the roads of the world. 2. A vehicle with a broken frame is useless. 3. The driver must not be helpless on the road. 4. Electric cars are smokeless. 5. In a frameless construction the body is so stiff that it replaces the frame.

Упражнение 8. ***Поставьте вопросы к подчеркнутым словам.***

1. He usually drives the car carefully. 2. Many lorries use diesel engines. 3. This type of a car develops high speed. 4. They will use a new suspension system in this motor vehicle. 5. We shall consider this problem in detail. 6. This engine gives much power.

Упражнение 9. ***Ответьте на следующие вопросы.***

1. Do you like to travel by car? 2. What type of a car have you? 3. Do you drive the car yourself? 4. Does your car develop high speed? 5. What is the speed of your car? 6. Do you drive carefully (осторожно)? 7. Have you a garage for the car? 8. Is your garage new? 9. Is the garage far from your house? 10. Are the roads in your town good?

Упражнение 10. ***Дайте возможные сочетания следующих прилагательных и существительных.***

Main, modern, convenient, light, stiff.

Component, purpose, body, motor vehicle, car, source.

Упражнение 11. ***Переведите предложения, обращая внимание на значение подчеркнутых слов.***

1. This motor plant makes diesel engines. 2. The power of the engine makes the wheels of the motor vehicle rotate. 3. What makes you think so? 4. This plant produces only light cars. 5. This is not the only plant of this type. 6. He is my only friend. 7. Next time we shall consider the main components of the steering system. 8. What do you usually do at this time of the day?

Упражнение 12. ***Переведите следующие предложения, выбрав из трёх слов одно, подходящее по смыслу.***

1. The power of the engine (does, makes, requires) the vehicle move. 2. The power train (gives, develops, transmits) the power from the engine to the wheels. 3. The wheels (support, use, attach) the motor vehicle. 4. In a frameless construction the body (produces, takes, replaces) the frame. 5. The body of a motor vehicle (moves, protects, follows) the driver and passangers. 6. The frame (increases, considers, supports) all the main units of the motor vehicle. 7. The brake system (stops, carries, begines) the vehicle.

Упражнение 13. ***Ответьте на вопросы по тексту 2А.***

1. What are the main components of a motor vehicle? 2. What is a source of power for a motor vehicle? 3. What type of engine is most convenient for a motor vehicle? 4. What does the chassis include? 5. What are the main components of the power train? 6. What is the function of the power train? 7. What does the running system consist of? 8. What does the frame of the motor vehicle support? 9. What is the main purpose of the body?

Упражнение 14. ***Закончите следующие предложения.***

1. The main components of a motor vehicle are . . . . 2. The source of power for a motor vehicle is . . . . 3. The chassis includes such units as . . . . 4. The power train consists of . . . . 5. The running system of a motor vehicle includes . . . . 6. The frame of the motor vehicle supports . . . . 7. The frameless construction is used for . . . . 8. The main purpose of the body is . . . .

Text 2B

<u>Задание 1.</u> Прочитайте следующие интернациональные слова и переведите их.

automobile, battery, electricity, gasoline, kilometre, signal

<u>Задание 2.</u> Прочитайте следующие слова и обратите внимание на их значение. Знание этих слов поможет Вам понять содержание текста.

1.	crowded	-	переполненный
2.	to get around the city	-	ездить по городу
3.	less	-	меньше, менее
4.	to park	-	ставить автомобиль на стоянку
5.	to power	-	приводить в действие
6.	space	-	пространство, место
7.	safe	-	безопасный

<u>Задание 3.</u> Прочитайте текст, стараясь понять основное содержание.

Cars for Tomorrow

1. One of the American car firms produced little cars which may some day take the place of today's big automobiles. If everyone drives such cars in the future, there will be less pollution in the air. There will also be more space for parking cars in cities, and the streets will be less crowded. Three such cars can fit in the space now needed for one car of the usual size.

2. The little cars will cost less. Driving will be safer, too, as these little cars can go only 65 kilometres per hour.

3. The cars of the future will be fine for getting around the city, but they will not be useful for long trips. If the car is powered by electricity, it will have two batteries-one battery for the motor and one for the signals, etc. Little cars which are powered by gasoline will go 450 kilometres before needing to stop for more gasoline.

4. If big cars are still used along with the small ones, two sets of roads will be needed in the future. Some roads will be used for the big, fast cars, and other roads will be used for the slower small cars.

Задание 4. ***Закончите предложения, выбрав из предложенных вариантов один, соответствующий содержанию текста.***

1. If we drive little cars there will be a) more pollution in the air; b) less pollution in the air. 2. Little cars need a) more space for parking than big cars; b) less space for parking than big cars. 3. Little cars will cost a) less than big cars; b) more than big cars. 4. Little cars will be fine a) for long trips; b) for getting around the city. 5. Little cars of the future a) will be very fast; b) will be slow.

Задание 5. ***а) Поставьте вопросы в правильной последовательности, соответствующей содержанию текста. б) Ответьте на вопросы.***

1. What will be the speed of the little cars of the future? 2. How many kilometres will the little cars go without stopping if they are powered by gasoline? 3. May little cars take the place of big automobiles in the future? 4. Will the streets of the cities be less crowded or more crowded if everyone drives little cars? 5. How many batteries will the little car need if it is powered by electricity? 6. How many little cars can fit in the space needed by one car of the usual size? 7. Why will driving little cars be safer? 8. How many sets of roads will be needed if big cars are used along with small cars? 9. Will little cars be used for getting around the city or for long trips? 10. Will little cars need less space for parking than big cars?

UNIT III. POWER UNIT

Упражнение 1. ***Образуйте форму прошедшего времени (Past Indefinite) от следующих правильных глаголов (обратите внимание на чтение окончания –ed).***

a) [d] to carry, to play, to require, to use, to follow, to move, to travel; b) [t] to develop, to replace, to produce, to increase, to look, to ask; c) [id] to rotate, to transmit, to consist, to support, to protect, to pollute, to include.

Упражнение 2. ***Скажите следующие неправильные глаголы в трех основных формах.***

to do, to make, to drive, to go, to know, to get, to give, to read, to say, to take.

Упражнение 3. ***Поставьте глаголы, данные в скобках, в прошедшем времени (Past Indefinite).***

1. Yesterday my working day (to begin) at 7 o'clock. I (to get up) and (to do) morning exercises. After breakfast I (to go) to the University. At the bus stop I (to see) my friend. We (to take) a bus and (to come) to the University ten minutes before the beginning of the lecture.

2. Last week we (to work) at the language laboratory. We (to listen) to the text, (to repeat) some words and sentences, (to answer) the questions on the text.

3. On Friday I (to come) to the reading hall in the afternoon. There (to be) many students. First I (to take) some newspapers and magazines and (to look) them through. Then I (to begin) doing my homework.

Упражнение 4. ***Скажите недостающие формы: утвердительную, вопросительную и отрицательную.***

Утвердительная форма	Вопросительная форма	Отрицательная форма
1. Last year he worked at the plant.		
2.	Did they finish this work yesterday?	
3.		They did not help me in this work.
4.	Did he study English at school?	
5.She liked this book very much.		
6.		We did not go to the Crimea last summer.
7.I met my friend at the library.		

Упражнение 5. ***Постройте по ключевым словам вопросы в прошедшем времени (Past Indefinite), употребляя "you" в качестве*** **подлежащего. Дайте ответы по ключевым словам.**

Образец: When/finish school — *last year.*

Вопрос: When did you finish school? — *I finished school last year.*

Questions	**Answers**
1. What school/finish	secondary school.
2. What subjects/study at school	mathematics, physics, English and other subjects.
3. When/enter the University	last year.
4. Where/live last year	with my parents.
5. How many lectures/have yesterday	two lectures.
6. When/come home yesterday	in the afternoon.
7. When/go to Moscow	two years ago.
8. What places of interest/ visit	the Red Square, the Kremlin.
9. Where/go yesterday	to see my friend.

Упражнение 6. ***Переведите следующие словосочетания с существительными в притяжательном падеже.***

Lermontov's poems, Gorky's books, this man's name, the workers' club, the children's room, these pupils' pictures, the boy's bag, his daughter's name, my friend's family, my brother's flat, a week's holiday, yesterday's newspaper.

Упражнение 7. ***Употребите форму притяжательного падежа существительного, данного в скобках.***

1. This is (my parents) flat. 2. This is (my brother) room. 3. Here you see (my sister) books. 4. (That student) name is Nick. 5. (My friend) working day begins at 8 o'clock. 6. What is (your friend) name? 7. (The students) books are on the table. 8. After the lecture the professor answered (the students) questions. 9. Students always listened to (Mendeleyev) lectures with great interest.

Упражнение 8. ***Переведите следующие интернациональные слова.***

base, classification, cylinder, gas, mechanics, method, machine, material, motocycle, problem, electric

Text 3A

Power Unit

The engine is the power unit of the vehicle. Any engine which uses the heat produced by burning a fuel to develop mechanical power is called a heat engine. The heat engine in which the fuel is burnt inside is called an internal combustion engine.

The first internal combustion engine was made by a Frenchman, Etienne Lenoir, in 1860. It ran on coal gas and worked on a cycle of operations which did not include compression of the gas before ignition. As a result it was not very efficient. In 1875 in Germany Dr. Otto described the cycle of operations consisting of four strokes. Otto's new engine was much more efficient than Lenoir's and was quiet. The cycle of operations consisting of four-strokes is known as the Otto cycle. Most modern automotive engines operate on this cycle. Internal combustion engines may be classified as follows: 1) according to the fuel they work on, as petrol engines, diesel engines, and gas engines; 2) according to the working cycle, as two-stroke engines and four-stroke engines; 3) according to the number of cylinders, as four-, six-, eight-, ten-, twelve-cylinder engines; 4) according to the arrangement of cylinders, as in-line engines, V-engines; 5) according to the method of cooling, as liquid-cooled and air-cooled engines.

The chemical energy of the fuel is converted into mechanical energy by interaction of the various engine parts. The main parts of the engine are the crank mechanism, the valve gear, the fuel system, the lubrication system, the cooling system, the ignition system.

Active Vocabulary

1. according to - в соответствии с, согласно
2. arrangement - расположение
3. automotive - автомобильный
4. to base - основать, базировать
5. before - перед

6. to burn - гореть, сгорать
7. chemical - химический
8. to classify - классифицировать
9. compression - сжатие
10. to convert - превращать, преобразовывать
11. cylinder - цилиндр
12. cycle - цикл
13. to describe - описывать
14. efficient - эффективный
15. energy - энергия
16. air-cooled engine - двигатель с воздушным охлаждением
17. in-line engine - однорядный двигатель
18. liquid-cooled engine - двигатель с жидкостным охлаждением
19. petrol engine - бензиновый двигатель
20. V-engine - V-образный двигатель
21. fuel - топливо
22. as follows - следующим образом
23. valve gear - клапанный механизм
24. heat - теплота
25. ignition - зажигание
26. mechanical - механический
27. method - метод, способ
28. crank mechanism - кривошипно-шатунный механизм
29. number - число, количество
30. to operate - работать
31. operation - работа
32. quiet - бесшумный, тихий
33. as a result - в результате
34. to run - работать
35. fuel system - топливная система
36. ignition system - система зажигания
37. lubrication system - система смазки
38. various - различный, разнообразный

Упражнение 9. ***Поставьте вопросы к подчеркнутым словам или словосочетаниям.***

1. The engineers made the first electric cars at the end of the 19th century. (2 вопроса). 2. In 1899 Russian engineer I. Romanov demonstrated the model of an electric car in Petersburg. (4 вопроса). His car developed speed of 38 kilometres per hour. (2 вопроса). 3. In 1931 the Russian motor works produced only 4,005 vehicles. (2 вопроса). 4. The Gorky Motor Works began producing lorries in 1932. (2 вопроса).

Упражнение 10. ***Переведите следующие словосочетания, обращая внимание на существительные в роли определений.***

fuel ignition, two-stroke-cycle engine, four-stroke cycle, lubrication system, engine lubrication, engine operation, cylinder arrangement, air compression, power source, motor vehicle, suspension system.

Упражнение 11. ***Переведите слова и словосочетания, данные в скобках, и прочитайте предложения.***

1. In Germany Dr. Otto began producing (газовые двигатели) in 1866. These engines were (эффективные) but very noisy. 2. This part of the book (описывает) the operation of the internal combustion engine on the four-stroke cycle (подробно). 3. All (автомобильные) engines have more than one (цилиндр). 4. Engines that burn their (топливо) inside the cylinders are known as internal combustion engines. 5. (Бензин) is a fuel that is usually used in motor vehicles. 6. Burning petrol produces a large amount of (теплоты). 7. Diesel engines use the heat of (сжатия) for fuel ignition. 8. Small motorcycles use (двухтактный) cycle engine.

Упражнение 12. ***Заполните пропуски словами, приведенными ниже.***

sources, to operate, converts, automotive, chemical, various, operation, cylinders, requires

1. A heat engine is a machine that . . . heat energy into mechanical energy. 2. One of the tasks of our scientists is to find (to find – находить) new . . . of energy. 3. Cooling, ignition and lubrication systems are very important for good . . . of a motor vehicle. 4. Most . . . engines have six or eight cylinders. 5. This car has eight . . . . 6. Many new enterprises began . . . in Siberia last year.

7. Modern . . . industry widely (широко) uses gas and coal for the production of many materials. 8. Motor vehicles are used for . . . purposes. 9. This operation . . . much time.

Упражнение 13. ***Выразите свое согласие или несогласие со следующими утверждениями, употребляя фразы: "That's right", "That's wrong".***

Образец: A. The power unit of the vehicle is the engine.
B. That's right. The engine is the power unit of the vehicle.

1. An internal combustion engine is the engine in which the fuel is burnt inside the cylinders of the engine. 2. The first internal combustion engine was made by an Englishman. 3. The first internal combustion engine worked on petrol. 4. The engine which Lenoir made in1860 was very efficient. 5. Dr. Otto was a German engineer. 6. Otto described a cycle of operations consisting of two strokes. 7. Most modern automotive engines operate on the four-stroke cycle.

Упражнение 14. ***Постройте предложения, соединив их части, приведенные в колонках А и В.***

A	B
1. The internal combustion engine	is a part of the chassis of the vehicle.
2. According to the arrangement of cylinders engines	transmits power from the engine to the wheels.
3. The petrol engine	are the main components of the power train.
4. According to the method of cooling engines	uses petrol for its operation.
5. The Otto cycle	are classified as in-line and V-engines.
6. The running system	are classified as air-cooled and liquid-cooled.

7. The power train	is the source of power for the vehicle.
8. The gearbox, the clutch and the propeller shaft	consists of four strokes.

<u>Упражнение 15.</u> Ответьте на вопросы по тексту 3А.

1. What is the power unit of the vehicle? 2. What engine is called a heat engine? 3. What engine is called an internal combustion engine? 4. When was the first internal combustion engine made? 5. What fuel did Lenoir's engine work on? 6. Was the first internal combustion engine efficient? 7. Who discribed the cycle of operations consisting of four strokes in 1875? 8. Was Otto's engine more efficient than Lenoir's engine? 9. What do we call the cycle of operations consisting of four strokes? 10. How are engines classified according to the fuel they work on? 11. What cylinder arrangements do you know? 12. Is air cooling used in internal combustion engines? 13. What are the main systems of the internal combustion engine?

Text 3B

<u>Задание 1.</u> Прочтите следующие интернациональные слова и переведите их.

transport, information, experiment, standard, technology, international

<u>Задание 2.</u> Прочтите следующие слова и обратите внимание на их значение. Знание этих слов поможет Вам понять основное содержание текста.

1. aircraft - авиация
2. bicycle - велосипед
3. century - столетие, век
4. to change - изменяться
5. to compete - конкурировать
6. to connect - соединять
7. conventional - обычный
8. cooperation - сотрудничество
9. decade - десятилетие

10. design - конструкция
11. flight - полет
12. glider - планер
13. interchange - обмен
14. invention - изобретение
15. railway - железная дорога
16. rather - довольно

<u>Задание 3.</u> Прочтите текст, стараясь понять основное содержание.

The Story of the Engine

1. At the end of the last century people could travel on the roads of Great Britain only on foot or by horse-drawn transport. The first bicycle was made in 1840 by McMillan in Scotland. It was a heavy vehicle with wooden wheels.

2. In 1875 Nicolas August Otto described an engine that changed people's life. His internal combustion engine powered the first automobiles and his engine gave man his wings.

3. In the early years of this century the pioneers of the aircraft used information on the engine design. In 1903 they used a conventional 12 hp gasoline engine in their glider. This glider rose from the ground and stayed high up for about 12 seconds in the morning of December 17,1903. On the same day another flight was made which lasted 59 seconds. These flights began the aircraft age and changed the history of the world.

4. The first decade of the century was very interesting for the development of the engine. It saw most of the main changes in the design of the petrol engine from the one cylinder engine to the four or six cylinder engines of 1910.

5. By 1910 automobile transport began to compete even with the railway. The design of petrol engines for motor vehicles had reached a very high level by that time. The in-line engine with four or six cylinders became standard both in Great Britain and abroad.

6. The further history of the engine is connected with its continuous improvement. International cooperation and interchange of new technology made possible to produce rather clean and efficient internal combustion engine.

7. Otto was not the first who experimented with engines, but it was his four-stroke cycle that put the world on wheels.

Задание 4. ***Укажите номера абзацев, заголовками к которым являются следующие утверждения.***

1.The beginning of the aircraft. 2. A little on the history of the first bicycle. 3. Otto's contribution to the engine development. 4. The importance of international cooperation for the engine development. 5. The first decade of our century is the period of inventions and intensive experiments.

Задание 5. ***Выразите свое согласие или несогласие со следующими утверждениями, употребляя фразы: "That's right", "That's wrong".***

1. The first bicycle was made in the 17th century. 2. The first bicycle was made in Germany. 3. Otto described a four-stroke-cycle engine in 1875. 4. The pioneers of the aircraft used a conventional gasoline engine in their first glider. 5. The first glider stayed in the air for about an hour. 6. The aircraft age began in 1903. 7. The main changes in the design of the petrol engine were made in the first decade of our century. 8. The automobile transport began to compete with the railway by 1940.

Задание 6. ***Ответьте на вопросы к тексту.***

1. How could people travel at the end of the last century? 2. When was the first bicycle made? 3. Who described a four-stroke-cycle engine? 4. What did the pioneers of the aircraft use for making the first gliders? 5. When did the aircraft age begin? 6. In what period were the main changes made in the design of the petrol engine? 7. What engines became standard in Great Britain and abroad by 1910? 8. When did the automobile transport begin to compete with the railway? 9. What is the history of the engine development connected with? 10. What engine was made as a result of international cooperation?

UNIT IV. THE CRANK MECHANISM

Упражнение 1. ***Прочитайте и переведите предложения, обращая внимание на сказуемое, выраженное глаголом в страдательном залоге.***

1. Many types of motor vehicles are produced in our ccountry. 2. All motor vehicles are classified into three main types: passenger cars, buses and lorries. 3. Lorries are used for carrying loads, buses and cars are used for carrying passengers. 4. "Zhiguli" cars are made by the Volzhsky Motor Works. 5. The power from the engine is transmitted to the wheels by the power train members. 6. According to the working cycle internal combustion engines are classified as four stroke engines and two stroke engines. 7. If the engine has a four-stroke cycle it is called a four-stoke-cycle engine.

Упражнение 2. ***Поставьте глаголы, данные в скобках, в настоящем времени (Present Indefinite) страдательного залога.***

1. This type of engine (to use) to drive motor vehicles. 2. The ignition system of the petrol engine (to consider) in the text in detail. 3. Most motor vehicle engines (to cool) by water. 4. Aircraft engines (to cool) by air. 5. The energy of water (to convert) into mechanical energy in hydraulic turbines. 6. The brakes (to use) to stop the motor vehicle. 7. The car (to support) by wheels. 8. A new type of the diesel engine (to develop) by the engineers of our plant. 9. A petrol engine develops little or no power at low speed, but if the speed (to increase) the engine will develop enough power to move the vehicle.

Упражнение 3. ***Ответьте на следующие вопросы.***

1. Is English studied at the University? 2. What other subjects are studied at your University? 3. What foreign language is studied by your friend? 4. Is English studied by many people in our country? 5. Is the book "War and Peace" translated into English? 6. What other books of Tolstoi are translated into English? 7. Is Russia visited by millions of people from other countries every year? 8. Is the town of Vladimir visited by many people from other cities and

towns of our country? 9. What cities are visited by millions of tourists every year?

<u>Упражнение 4.</u> Прочитайте следующие интернациональные слова и найдите соответствующие им русские.

Cylinder block, form, turbine, structure, method, mechanism, universal, electricity, atom, metal.

Механизм, блок цилиндров, структура, универсальный, метод, форма, турбина, металл, атом, электричество.

Text 4A

The Crank Mechanism

The crank mechanism of an engine includes the cylinder block with the cylinder head, pistons with piston rings and piston pins, connecting rods, the crankshaft with the flywheel and the crankcase. In its simplest form the cylinder is a tube which is closed at one end. Now cylinders are usually cast in blocks of four, six and more cylinders in one block. The cylinder head is secured to the cylinder block with studs and nuts.

The piston fits closely inside the cylinder and is free to move up and down. It has piston rings (compression and oil control rings) which prevent gas leakage through the clearance between the piston and the cylinder. The piston is joined to the connecting rod by the piston pin.

The connecting rod connects the piston to the crankshaft. The main parts of the connecting rod are the shank of the rod and two ends. The end of the connecting rod which fits on the piston pin is small and it is called the small end. The end which fits on the crankshaft is big and it is called the big end.

The crankshaft is the principal part of the crank mechanism. It is formed of main journals, crank pins or crank journals and webs. The main journal is carried in bearings in the crankcase. The flywheel is attached to the rear end of the crankshaft.

Now the cylinders and the crankcase are usually made as a single casting and it forms the main structure of the engine. The crank mechanism converts the reciprocating motion of the piston into the rotary motion of the crankshaft.

Active Vocabulary

1. almost - почти
2. bearing - подшипник
3. cylinder block - блок цилиндров
4. to call - называть
5. to cast - отливать (металл)
6. casting - отливка
7. to connect - соединять
8. crankcase - картер двигателя
9. crankshaft - коленчатый вал
10. closely - плотно
11. clearance - зазор
12. end - головка (шатуна)
13. big end - большая (кривошипная) головка (шатуна)
14. small end - малая (поршневая) головка (шатуна)
15. free - свободный
16. to fit - устанавливать, пригонять
17. flywheel - маховик
18. form - форма
19. to form - составлять
20. cylinder head - головка цилиндра
21. to join - присоединять
22. main journals - коренные шейки (коленчатого вала)
23. crank journals - шатунные шейки
24. leakage - утечка
25. motion - движение
26. nut - гайка
27. piston - поршень
28. piston pin - поршневой палец
29. to prevent - предотвращать

30. principal - главный, основной
31. rear end - задняя часть
32. reciprocating - возвратно-поступательный
33. piston ring - поршневое кольцо
34. oil control ring - маслосъемное кольцо
35. connecting rod - шатун
36. rotary - вращательный
37. to secure - прикреплять
38. single casting - цельная отливка
39. simple - простой, элементарный
40. shank - стержень
41. stud - шпилька
42. structure - структура
43. tube - трубка, труба
44. web - щека (кривошипа)

Упражнение5. ***Поставьте глаголы, данные в скобках, в настоящем времени (Present Indefinite) действительного или страдательного залога.***

1. The cylinder block, the cylinder head and the crankcase (to form) the main body of the engine, all other parts (to attach) to them. 2. The crankcase (to protect) the main parts of the engine against dust and mud (грязь). 3. The cylinder head (to cast) separately (отдельно) from the cylinder block. 4. The crankcase of the engine (to support) the cylinders and the crankshaft. 5. The connecting rod (to join) the piston pin of the piston with the crankpin of the crankshaft. 6. The crankshaft (to make) of a steel casting. 7. The clutch usually (to attach) to the rear of the engine. 8. The drivers (to use) the brakes to stop the motor vehicle. 9. The internal combustion engines (to classify) into several (несколько) types according to the number of cylinders.

Упражнение 6. ***Укажите предложения текста 4А, в которых сказуемое выражено глаголом в страдательном залоге.***

Упражнение 7. ***Переведите предложения и укажите, какой частью речи являются подчеркнутые слова.***

1. There are many forms of energy. 2. The diesel engine is a form of the internal combustion engine. 3. In modern automotive engines all cylinders and the greater part of the crankcase are cast in one casting which forms the main structure of the engine. 4. Next year the output of cars will be increased. 5. The increase of the motor vehicle output is one of the tasks of the motor industry. 6. The door of the car was closed. 7. There is a bus-stop close to the Institute.

Упражнение 8. ***Сгруппируйте следующие слова по парам синонимов.***

to work, to connect, to make, to join, component, to operate, to produce, part.

Упражнение 9. ***Заполните пропуски словами, приведёнными ниже.***

1. The purpose of the compression ring is to prevent gas . . . . 2. The space between the piston and the cylinder wall is called . . . . 3. The . . . motion of the piston is converted into the rotary motion by the connecting rod and the crankshaft. 4. There is . . . at each end of the connecting rod. 5. The small end of . . . is connected to the piston by the piston pin. 6. The big end of the connecting rod is connected with . . . . 7. . . . is attached to the rear end of the crankshaft. (The flywheel, the connecting rod, clearance, a bearing, leakage, reciprocating, the crankshaft).

Text 4 B

Задание 1. ***Прочтите следующие интернациональные слова и переведите их:***

aluminium, component, energy, gas, metal, film, material.

Задание 2. ***Прочтите следующие слова и обратите внимание на их значение. Знание этих слов поможет Вам понять основное содержание текста.***

1. alloy - сплав
2. combustion chamber - камера сгорания
3. compression ring - компрессионное кольцо

4.	to depend (upon)	-	зависить (от)
5.	to expand	-	расширять (ся)
6.	to leak	-	протекать, просачиваться
7.	mixture	-	смесь
8.	necessary	-	необходимый
9.	oil	-	масло
10.	size	-	размер
11.	to transform	-	превращать

<u>Задание 3.</u> Прочтите текст, стараясь понять основное содержание.

Pistons and Piston Rings

The piston is the most important component of the engine. It transforms the energy produced by burning the mixture of air and fuel into linear motion. This motion is then transformed into rotary motion by the connecting rod and the crankshaft.

As the piston must move freely in the cylinder there is some clearance between these two parts. This clearance is necessary because the temperature of the piston is higher than the temperature of the cylinder walls and the piston expands more. This clearance also gives a space for a film of oil between the piston and the cylinder walls. The amount of clearance depends upon the metal of which the piston is made. It also depends upon the size and the design of the piston.

Early engines had pistons made of cast iron. In 1913 aluminium was first used for pistons. Now the pistons for the petrol engines are usually made of aluminium alloys.

If there is clearance between the piston and the cylinder some of the burning gases can leak from the combustion chamber into the crankcase. To prevent the gas leakage through the clearance between the piston and the cylinder the piston rings are used.

The usual piston ring combination includes two or three compression rings and one or two oil control rings.

Задание 4. ***Выразите своё согласие или несогласие со следующими утверждениями, употребляя фразы: "That's right", "I'hat's wrong".***

1. The piston transforms the energy produced by burning the mixture of air and fuel into rotary motion. 2. The clearance between the piston and the cylinder walls is necessary. 3. The amount of clearance between the piston and the cylinder does not depend upon the design of the piston. 4. Now the pistons of the petrol engines are made of aluminium alloys. 5. The piston rings prevent the gas leakage through the clearance between the piston and the cylinder. 6. The piston usually has one compression ring and one oil control ring.

Задание 5. ***Закончите предложения, выбрав из предложенных вариантов один, соответствующий содержанию текста.***

1. The linear motion of the piston is transformed into rotary motion by a) the valve gear; b) the connecting rod and the crankshaft. 2. Early engines had pistons made of a) aluminium alloys; b) cast iron. 3. Aluminium was first used for pistons a) in 1913; b) in 1930. 4. When the engine is operating the temperature of the piston is a) higher than the temperature of the cylinder walls; b) lower than the temperature of the cylinder walls. 5. Some of the burning gases can leak a) from the crankcase into the combustion chamber; b) from the combustion chamber into the crankcase. 6. The film of oil between the piston and the cylinder walls is a) necessary; b) unnecessary.

Задание 6. ***Ответьте на вопросы к тексту 4 В.***

1. Is the piston the most important component of the engine? 2. What components transform the linear motion of the piston into the rotary motion? 3. Why is the clearance between the piston and the cylinder walls necessary? 4. What does the amount of clearance depend upon? 5. What material was used for pistons in early engines? 6. What are the pistons of the petrol engines made of now? 7. What is used to prevent the gas leakage from the combustion chamber into the crankcase? 8. How many rings does the usual piston ring combination include?

UNIT V. THE PRINCIPLES OF OPERATION OF AN ENGINE THE FOUR-STROKE CYCLE

Упражнение 1. ***Прочтите и переведите предложения, обращая внимание на глагол-сказуемое в страдательном залоге.***

1. I am often asked at the lessons. 2. The students' questions are usually answered at the end of the lecture. 3. The text "Power Unit" is followed by the text "The Crank Mechanism". 4. This book is much spoken about. 5. Students are often shown strip films (диафильм) at English lessons. 6. They are taught to drive a car. (to teach - обучать). 7. The students are taught English, German and French at the University. 8. In the first year the students of the University are taught mathematics, physics and other subjects.

Упражнение 2. ***Переведите предложения, пользуясь таблицей, приведенной ниже.***

1. В этом году студентам читают лекции по физике и математике. 2. Его лекции всегда слушают с большим вниманием. 3. На новые автомобили всегда смотрят с интересом. 4. Студентам выдают иностранные журналы в библиотеке. 5. Об этом фильме много говорят. 6. Ей велят много ходить пешком. 7. На его работы часто ссылаются (to refer to - ссылаться на) во многих статьях. 8. Мне обычно приносят газеты утром. (to bring - приносить).

New cars	is told	with interest	in many papers
This film	are given		
She	are often referred to	lectures on physics and mathematics	
The students	are always looked at	newspapers	in the library
His works	are always listened to	to walk much	this year
I	is much spoken of	foreign magazines	in the morning
His lectures	am usually brought	with great attention	

<u>Упражнение 3.</u> Прочтите следующие интернациональные слова и найдите соответствующие им русские слова:

centre, principle, carburettor, proportion, magnet, organization, electric, temperature, inertia, practice

температура, организация, практика, инерция, карбюратор, магнит, пропорция, электрический, принцип, центр

Text 5 A

The Principles of Operation of an Engine

The Four-Stroke Cycle

Most modern engines operate on the four-stroke cycle. This cycle is often spoken of as the Otto cycle. When the engine works the piston moves up and down the cylinder and reaches the highest and the lowest points in its travel. The highest position of the piston in the cylinder is called "top dead centre" (tdc), the lowest "bottom dead centre" (bdc). The movement of the piston from one dead centre to another is called a stroke. The operation of an engine requires the continuous repetition of four strokes which make up a cycle of operations.

Let us consider the operation of a four-stroke cycle carburettor engine. Before petrol can be burnt, it must be vaporized and mixed with air. Petrol and air are mixed in the correct proportions by a carburettor. This mixture enters the cylinder through a hole called the inlet port.

The complete cycle consists of the following four strokes:

<u>The induction stroke.</u> The piston moves down the cylinder, the inlet port is open, the exhaust port is closed. The mixture of petrol vapour and air fills the cylinder.

<u>The compression stroke.</u> The piston moves up the cylinder and compresses the mixture into the top end of the cylinder called the combustion chamber. Both ports are closed.

<u>The power stroke.</u> At the end of the compression stroke an electric spark ignites the mixture, the pressure increases and forces the piston down the cylinder. The ports are still closed.

The exhaust stroke. The piston moves up the cylinder. The inlet port is still closed while the exhaust port is open. The burnt gases escape from the cylinder. At the end of the exhaust stroke the exhaust port closes and the inlet port opens again ready for the next induction stroke. The four-stroke cycle is completed in time of two revolutions of the crankshaft.

Active Vocabulary

1. air - воздух
2. another - другой
3. bottom dead centre - нижняя мертвая точка
4. top dead centre - верхняя мертвая точка
5. complete - полный, законченный
6. to complete - заканчивать, завершать
7. combustion chamber - камера сгорания
8. to compress - сжимать, сдавливать
9. continuous - непрерывный, длительный
10. correct - правильный, точный
11. to enter - входить, поступать
12. electric - электрический
13. to escape - выходить
14. following - следующий, последующий
15. to force - заставлять, вынуждать
16. to fill - наполнять(ся); заполнять
17. to ignite - зажигать(ся); воспламенять(ся)
18. a hole - отверстие
19. low - низкий
20. to make up - составлять
21. to mix - мешать, смешивать, перемешивать
22. mixture - смесь
23. movement - движение, перемещение
24. often - часто
25. principle - принцип
26. port - окно, канал, отверстие

27. exhaust port - выходное отверстие
28. inlet port - впускное отверстие
29. point - точка
30. position - положение, позиция
31. proportion - пропорция, соотношение
32. pressure - давление
33. to reach - достигать
34. ready - готовый
35. repetition - повторение
36. revolution - вращение, оборот
37. still - все еще
38. exhaust stroke - ход выпуска; такт выпуска
39. compression stroke - ход сжатия; такт сжатия
40. induction stroke - ход впуска; такт впуска
41. power stroke - рабочий ход; рабочий такт
42. through - через
43. to vaporize - испаряться

Упражнение 4. Определите, к какой части речи относятся выделенные в данных предложениях слова. Переведите предложения.

1. The piston of the engine forms the movable wall of the combustion chamber. 2. Heat is the form of energy. 3. The piston head heats more than the cylinder walls. 4. At high engine speeds large inertia forces act on the piston. 5. During the power stroke the increased pressure of gases forces the piston down the cylinder. 6. The piston rings are fitted to prevent the escape of gas through the clearance between the cylinder and the piston. 7. When the power stroke is almost completed the exhaust port begins to open and the burnt gases which are still under pressure escape from the cylinder. 8. The complete cycle of operations of the two-stroke engine includes two strokes.

Упражнение 5. ***Прочтите и переведите предложения, обращая внимание на глагол-сказуемое в страдательном залоге.***

1. This is the type of ignition which is often met with in practice. 2. These cars are referred to as completely new, from the wheels to the top of the body. 3. This crankshaft is spoken of as simple and well balanced. 4. A new type of petrol engine was spoken of at the conference. 5. A new air-cooled diesel engine is looked at with interest. 6. Many tenth-formers are taught to drive motor vehicles.

Упражнение 6. ***Прочтите и переведите предложения, выбрав одно из трех слов, подходящее, по смыслу.***

1. The carburettor (operates, mixes, reaches) petrol and air in correct proportions. 2. Induction, compression, power and exhaust strokes (classify, make up, convert) a complete cycle of operations. 3. The mixture of petrol vapour and air (forms, escapes, fills) the cylinder during the induction stroke. 4. Otto made the engine which (completed, compressed, forced) its fuel mixture before igniting it. 5. There are engines which operate on a cycle which (is filled, is ignited, is completed) into two strokes. 6. Engines that (burn, fit, reach) their fuel in the chambers of the cylinders are known as internal combustion engines.

Упражнение 7. ***Прочтите и переведите предложения, заполните пропуски словами и словосочетаниями, приведёнными ниже.***

1. During the process of . . . the temperature of the gases in the cylinder of any internal combustion engine is high. 2. When the mixture of petrol vapour and air is ignited and burnt the gas . . . increases. 3. These fuels do not . . . readily. 4. In the wall of . . . there is a port through which the mixture of petrol vapour and air enters the cylinder. 5. The petrol engine is an internal combustion engine which burns petrol and uses . . . to ignite its fuel. 6. The diesel engine is an internal combustion engine in which fuel . . . by the heat of compression.

(Pressure, an electric spark, combustion, vaporize, the combustion chamber, is ignited.)

Упражнение 8. ***Выразите согласие или несогласие со следующими утверждениями, употребляя фразы: "That's right"."That's wrong".***

Pattern: A. During the induction stroke both ports are closed.

B. That's wrong. During the induction stroke the inlet port is open, the exhaust port is closed.

1. The mixture of petrol vapour and air fills the cylinder during the compression stroke. 2. During the compression stroke both ports are closed. 3. An electric spark ignites the mixture of petrol vapour and air at the end of the power stroke. 4. During the exhaust stroke the piston moves down the cylinder. 5.The burnt gases escape from the cylinder during the induction stroke. 6. Each cylinder of an engine has only two ports: the inlet port and the exhaust port. 7. The four-stroke cycle is completed in time of one revolution of the crankshaft.

Упражнение 9. ***Закончите следующие предложения.***

1. The highest position of the piston in the cylinder is called . . . 2. The lowest position of the piston in the cylinder is called . . . 3. The movement of the piston from one dead centre to another is called . . . 4. In a carburettor engine petrol and air are mixed by . . . 5. A hole through which the mixture of petrol vapour and air enters the cylinder is called . . . 6. A hole through which the burnt gases escape from the cylinder is called . . . 7. The top end of the cylinder is called . . .

Упражнение 10. ***Ответьте на вопросы по тексту 5А.***

1. What cycle do most modern engines operate on? 2. What position of the piston in the cylinder is called t.d.c.? 3. What position of the piston is called b.d.c.? 4. What is a stroke? 5. What strokes does the cycle of operations of a four-stroke engine consist of? 6. What unit is used to mix petrol and air? 7. What do we call a hole through which the mixture of petrol vapour and air enters the cylinder? 8. What do we call a port through which the burnt cases

escape from the cylinder? 9. The four stroke cycle is completed in time of two revolutions of the crankshaft, isn't it?

Text 5 B

Задание 1. ***Прочтите следующие слова и обратите внимание на их значение. Знание этих слов поможет Вам понять основное содержание текста.***

1.	above	-	выше
2.	to adapt	-	приспосабливать
3.	below	-	ниже
4.	to decrease	-	уменьшать
5.	to differ	-	отличаться
6.	to flow	-	течь
7.	to overrun	-	переходить
8.	same	-	тот же самый
9.	transfer port	-	перепускное окно
10.	downward stroke	-	ход поршня вниз
11.	upward stroke	-	ход поршня вверх

Задание 2. ***Прочитайте текст, стараясь понять основное содержание. Определите тематику текста и озаглавьте его.***

1. The two-stroke-cycle engine differs from the four-stroke-cycle engine in that the operations making up the cycle take place during two strokes of the piston (the upward stroke and the downward stroke) and one revolution of the crankshaft. Power is developed during each downward stroke of the piston. 2. Let us consider the operation of the two-stroke-cycle engine. Beginning with the piston on its upward stroke, all three ports (the inlet port, the exhaust port and the transfer port) are closed. The upward movement of the piston compresses the mixture in the top of the cylinder and at the same time decreases the pressure under the piston. Near the end of the stroke the piston overruns the inlet port thus opening it and fresh mixture fills the lower part of

the engine. The mixture above the piston is ignited in the same way as in the four-stroke engine and high pressure of the burnt gases forces the piston down the cylinder. A little below top dead centre the piston closes the inlet port and further downward movement of the piston compresses the mixture in the crankcase. At the end of the stroke the piston overruns the exhaust port and the burnt gases begin to escape from the cylinder. The transfer port is open and the mixture compressed below the piston flows into the cylinder above the piston through the transfer port. As the piston goes up on the next stroke the transfer and exhaust ports are closed and the cycle of operations begins again. 3. The two-stroke cycle is not well adapted to petrol engines using carburettors. Two-stroke-cycle diesel engines, however, are widely used in lorries and buses.

Задание 3. ***Запишите пункты плана в последовательности, соответствующей тексту.***

1. The description of the two-stroke cycle of operations. 2. The use of the two-stroke engine. 3. The main difference between the four-stroke cycle and the two-stroke cycle.

Задание 4. ***Закончите предложения, выбрав из предложенных вариантов один, соответствующий содержанию текста.***

1. The two-stroke cycle takes place during a) one revolution of the crankshaft; b) two revolutions of the crankshaft. 2. In the two-stroke engine power is developed during a) each downward stroke of the piston; b) each upward stroke of the piston. 3. The ports in a two-stroke engine are opened and closed a) by the valves; b) by the piston itself. 4. The upward movement of the piston compresses the mixture a) in the top of the cylinder; b) in the crankcase. 5. The mixture compressed below the piston flows into the top of the cylinder through a) the inlet port; b) the transfer port. 6. The mixture in a two-stroke engine is ignited a) in the same way as in a four-stroke engine; b) in another way than in a four-stroke engine.

Задание 5. ***Ответьте на вопросы по тексту.***

1. What is the difference between the four-stroke cycle and the two-stroke cycle of operations? 2. What do we call the strokes of the two-stroke cycle? 3. During what stroke is power developed? 4. What ports are there in the cylinder of a two-stroke engine? 5. What opens and closes the inlet and the exhaust ports? 6. Is the mixture above the piston ignited in the same way as in a four-stroke engine? 7. What forces the piston down the cylinder? 8. Is the two-stroke cycle well adapted to petrol engines?

UNIT VI. THE VALVE GEAR

Упражнение 1. ***Переведите следующие предложения, обращая внимание на время и залог сказуемого.***

1. The Zhiguli cars are produced by the Yolzhsky Automobile Plant in Togliatti. 2. Students were explained (to explain - объяснять) the principles of operation of a four-stroke engine. 3. She will be given interesting work. 4. The tasks facing us will be spoken of at the meeting tomorrow. 5. Now the frameless construction is widely used in cars. 6. The students were shown the strip film "The Main Parts of the Internal Combustion Engine". 7. They will be shown the model of a new car. 8. The reciprocating motion of the pistons is converted into the rotary motion of the crankshaft by the crank mechanism. 9. The cycle of operations consisting of four strokes was described by Otto in 1875. 10. The students' questions will be answered after the lecture.

Упражнение 2. ***Ответьте на следующие вопросы, обращая внимание на употребление страдательного залога.***

1. Are you often asked at the English lessons? 2. Were you asked at the English lesson yesterday? 3. Will you be given lectures on internal combustion engines next year? 4. Were the models of new motor vehicles shown at the exhibition (выставка) last year? 5. Were you explained the principles of operation of petrol engines at the last lesson? 6. Are the brakes used to stop motor vehicles? 7. What are the brakes used for? 8. The cylinder head is secured

to the cylinder block with studs and nuts, isn't it? 9. What is the cylinder head secured to the cylinder block with? 10. The diesel engine was invented by Dr. Rudolf Diesel in 1892, wasn't it? 11. When was the diesel engine invented? 12. Whom was the diesel engine invented by? 13. When was the first internal combustion engine made? 14. Will new types of motor vehicles be developed in future?

Text 6 A

The Valve Gear

In the previous text the operation of the four-stroke carburettor engine was discussed. It was mentioned that gases enter and leave the cylinder through ports. These ports must be open only during that part of the cycle when gas must pass through them. At all other times they are closed. It is the function of the valves to close and to open the ports at the correct times.

The valve is the main component of the valve gear. Now the only type of valve which is used in motor vehicle engines is the poppet valve. Only this type of valve will be discussed in the text. The poppet valve consists of the head and the stem.

The valve slides in a hole in the cylinder or cylinder head which is called the valve guide. The general practice is to make the valve guides in the form of a bushing.

The valves are opened by cams and closed by springs. The cams do not act directly upon the valves. Tappets are usually fitted between the cam and the valve. The cams are carried on a shaft called the camshaft. The camshaft is driven by the crankshaft. In the majority of engines the camshaft is fitted in the crankcase close to the crankshaft, so a short driving gear can be used.

The usual arrangement consists of sprockets fitted on the crankshaft and camshaft. In an engine working on the four-stroke cycle each valve opens once every two revolutions of the crankshaft. So the camshaft must rotate at one-half the speed of the crankshaft. That's why the camshaft sprocket has twice as many teeth as the crankshaft sprocket.

Some engines have overhead valves operated by the camshaft in the crankcase. As the camshaft rotates the cams actuate the tappets which move up and transmit the motion to the valve through push rods and overhead rockers.

In modern engines the camshaft is sometimes carried on the cylinder head. This is the simplest and most direct method of actuating valves. This reduces the weight of the valve-operating mechanism but it requires a longer and more complex driving arrangement for the camshaft.

Active Vocabulary

1.	to act	-	влиять, действовать
2.	to actuate	-	приводить в действие
3.	between	-	между
4.	bushing	-	втулка
5.	cam	-	кулачок
6.	camshaft	-	распределительный вал
7.	complex	-	сложный
8.	development	-	развитие; усовершенствование
9.	direct	-	прямой
10.	directly	-	прямо, непосредственно
11.	to discuss	-	обсуждать
12.	each	-	каждый, всякий
13.	f unction	-	назначение
14.	gear	-	шестерня
15.	driving gear	-	приводной механизм, передача
16.	general	-	общепринятый, обычный
17.	valve guide	-	направляющая клапана
18.	half	-	половина
19.	to leave	-	выходить; покидать
20.	majority	-	большинство
21.	to mention	-	упоминать
22.	once	-	(один) раз
23.	to pass	-	проходить
24.	previous	-	предыдущий

25. practice - применение
26. to reduce - уменьшать, понижать
27. overhead rocker - подвесное коромысло
28. push rod - шток толкателя клапана
29. to slide - скользить
30. stem - стержень
31. spring - пружина
32. shaft - вал
33. sprocket - звездочка
34. tappet - толкатель (клапана)
35. tooth - зуб
36. twice - вдвое больше
37. usual - обычный
38. usually - обычно
39. valve - клапан
40. overhead valve - верхний клапан, подвесной клапан
41. poppet valve - подъемный клапан
42. weight - вес
43. that's why - вот почему

<u>Упражнение 3.</u> Употребите глаголы, данные в скобках, в форме Present, Past или Future Indefinite страдательного залога.

1. The movement of the valves of an engine (to control) by the camshaft. 2. The camshaft (to drive) by the crankshaft to which it (to connect) by gears. 3. Valves (to close) by springs. 4. The poppet valve (to use) on steam engines before the internal combustion engine (to develop). 5. The development of a new engine (to complete) next year. 6. In this engine the overhead valves (to operate) by the camshaft in the crankcase. 7. The main components of the valve gear (to discuss) in our lecture next week. 8. It (to mention) that the function of the piston rings is to prevent gas leakage through the clearance between the piston and the cylinder.

Упражнение 4. ***Употребите глаголы, данные в скобках, в форме Present, Past или Future Indefinite действительного или страдательного залога.***

1. The piston (to complete) its stroke during one half revolution of the crankshaft. 2. An engine in which four strokes of the piston (to require) to complete the working cycle is known as a four-stroke engine. 3. In a four-stroke engine each valve (to open) once at every two revolutions of the crankshaft. 4. The valves (to open) by cams. 5. In 1970 344000 cars and 47000 buses (to produce) by the motor industry of our country. 6. In 1975 the Gorky, Ulyanovsk and Zaporozhsky Works (to produce) 1.3 million vehicles. 7. In future the output of motor vehicles (to increase). 8. The construction of this motor vehicle plant (to complete) next year.

Упражнение 5. ***Переведите следующие словосочетания.***

valve gear, valve spring, motor vehicle engine, poppet valve, overhead valves, overhead rockers, valve guide, driving gear, camshaft sprocket, crankshaft sprocket, cylinder head, valve-operating mechanism

Упражнение 6. ***Прочтите и переведите предложения, выбрав из трёх слов одно, подходящее по смыслу.***

1. When the camshaft is carried on the cylinder head the weight of the valve-operating mechanism (is reduced, is increased, is reached). 2. The function of (the teeth, the rockers, the valves) is to open and to close the ports. 3. In the previous text the main components of the crank mechanism of the internal combustion engine (were developed, were discussed, were classified). 4. The mechanism which (actuates, connects, converts) the valves is driven from the crankshaft by gears. 5. The great (construction, majority, arrangement) of engines today is fitted with the poppet valve system. 6. (The frame, the piston, the spring) must be strong enough (достаточно сильной) to close the valve quickly at maximum speed.

Упражнение 7. ***Ответьте на вопросы по тексту 6 А.***

1. What do gases enter and leave the cylinder through? 2. Are the ports always open? 3. When must the ports be open? 4. What is the function of the valves? 5. What is the main component of the valve gear? 6. What is the only type of valve used in motor vehicles now? 7. What does a poppet valve consist of? 8. Are the valves closed by cams? 9. What are the valves opened by? 10. Do the cams act directly upon the valves? 11. Where are tappets usually fitted? 12. What is the camshaft driven by? 13. Where is the camshaft fitted in the majority of engines? 14. Why does the camshaft sprocket have twice as many teeth as the crankshaft sprocket? 15. Where is the camshaft sometimes carried in modern engines?

Упражнение 8. ***Закончите следующие предложения.***

1. The main component of the valve gear is . . . . 2. The only type of valve which is used in motor vehicles is . . . . 5. The valve slides in a hole in the cylinder or cylinder head which is called . . . . 4. The valve guides are often made in the form of . . . . 5. The valves are opened by . . . . 6. The valves are closed by . . . . 7. The cams are carried on a shaft called . . . . 8. The camshaft is drivin by . . . . 9. The camshaft is connected with the crankshaft by . . . . 10. The motion from the camshaft is transmitted to the valves through . . . .

Упражнение 9. ***Кратко перескажите текст по следующему плану.***

1. The function of the valves. 2. The type of the valve used in internal combustion engines now. 3. The main elements of the poppet valve. 4. The main components of the valve gear (the valve, the valve guide, cams, tappets, the camshaft, the springs, driving gear). 5. Speak of the camshaft (how it is driven, where it is fitted).

Text 6 B

<u>Задание 1.</u> Прочтите следующие слова и обратите внимание на их значение. Знание этих слов поможет Вам понять основное содержание текста.

1.	advantage	-	преимущество
2.	oil consumption	-	расход масла
3.	drawback	-	недостаток
4.	early	-	ранний
5.	steam engine	-	паровой двигатель
6.	to prove	-	оказываться
7.	to uncover	-	открывать
8.	rotary valve	-	поворотный золотник
9.	sleeve valve	-	цилиндрический золотник
10.	slide valve	-	скользящий золотник

<u>Задание 2.</u> Прочитайте текст, стараясь понять основное содержание.

Types of Valves

During the development of internal combustion engines several types of valves were used. The main of them are:

1. The poppet valve. This was already in use on steam engines and on the early types of internal combustion engines. It has proved so successful that it is almost the only type used in modern engines.

2. The slide valve. This was commonly used on some early internal combustion engines, but proved less satisfactory than the poppet valve.

3. The sleeve valve. Several types of sleeve valve were used. The two most successful were the Knight and the Burt-Mc Cullum.

The Knight type was developed in about 1905. It consisted of two sleeves free to slide inside the cylinder. The sleeves were moved up and down inside

the cylinder, the ports cut in the sleeves uncovered the cylinder ports at the correct times.

The Burt-Mc Cullum sleeve valve consisted of a single sleeve. It was developed in about 1909 and was successfully used in aircraft engines.

Although these types of valve had many advantages they are not used in motor vehicle engines. Their main drawback was a relatively high oil consumption and a smoky exhaust.

4. The rotary valve. Several types of rotary valve were developed and some of them gave good results. They consist of rotary "plugs" having holes which, at correct times, uncover the cylinder ports and allow gas to pass.

Задание 3. ***Закончите предложения, выбрав из предложенных вариантов один, соответствующий содержанию текста.***

1. The type of valve commonly used in modern engines is a) the rotary valve; b) the poppet valve. 2. The slide valve proved to be a) more satisfactory than the poppet valve; b) less satisfactory than the poppet valve. 3. The sleeve types of valve were developed a) at the beginning of the century; b) at the end of the century. 4. A relatively high oil consumption is a) the main advantage of the sleeve valve; b) the main drawback of the sleeve valve. 5. The type of valve having rotating "plugs" which uncover cylinder ports is called a) a rotary valve; b) a slide valve.

Задание 4. ***Ответьте на вопросы по тексту 6 В.***

1. What types of valves were used on internal combustion engines? 2. What is the commonly used type of valve now? 3. Was the poppet valve used on steam engines? 4. What were the most successful types of the sleeve valve? 5. What was the main principle of operation of the Knight type of the sleeve valve? 6. What was the main drawback of the sleeve valve? 7. Did some types of the rotary valve give good results?

UNIT VII. THE FUEL SYSTEM OF A PETROL ENGINE

Упражнение 1. ***Переведите следующие предложения, обращая внимание на употребление времен.***

1. The students of this group often discuss new books in their club.
2. The students discussed a new book at the meeting of their club yesterday.
3. The students will discuss a new book at the meeting of their club to-morrow.
4. This new engine is tested in some laboratories.
5. This engine was tested last month.
6. The engine will be tested under different conditions.

1. The students are discussing a new book now.
2. The students were discussing a new book when I came.
3. The students will be discussing a new book of this writer at the meeting of their club to-morrow at 7 o'clock p.m.
4. This new engine is being tested at our laboratory now.
5. This engine was being tested when I entered the laboratory.

Упражнение 2. ***Ответьте на следующие вопросы.***

1. Are you reading a newspaper? 2. What are you reading? 3. Do you usually read newspapers in the morning or in the evening? 4. When do you usually read newspapers? 5. Are you having an English lesson now? 6. What lesson are you having now? 7. How many times a week do you have your English lessons? 8. Is your friend speaking English now? 9. What language is your friend speaking now? 10. Is she reading an English or a Russian book? 11. What book is she reading now? 12. Are you doing an exercise now? 13. What exercise are you doing now? 14. When do you usually do your written exercises?

Упражнение 3. ***Скажите недостающие формы: утвердительную, вопросительную и отрицательную.***

Утвердительная	Вопросительная	Отрицательная
1. The engine is running at a speed of 2000 revolutions per minute now.		
2.	Are they completing the construction of the plant?	
3.		Fuel is not entering the cylinder now.
4. The car was going along the street at high speed when I saw it.		
5.		They will not be leaving for Moscow at 3 o'clock to-morrow.
6.	Was she making an experiment when they entered the laboratory?	

Упражнение 4. ***Задайте по ключевым словам вопросы, употребляя "you" в качестве подлежащего и глагол-сказуемое в форме Continuous Tenses. Ответьте на вопросы по ключевым словам.***

Pattern: Where (to go) *to the University*

Where are you going? *I am going to the University.*

Questions	Answers
1. What lecture (to have) at that time yesterday?	a lecture on physics
2. Whom (to speak) to when I saw you?	my friend
3. What book (to look through) now?	a book on motor vehicle technology
4. What (to do) at this time to-morrow?	to watch a TV programme
5. What (to test) now?	a new engine

Text 7 A

The Fuel System of a Petrol Engine

Petrol is a fuel which is particularly suitable for use in motor vehicles. When it is burnt it gives a large amount of heat. Before petrol can be burnt it must be vaporized and mixed with suitable amount of air. It is the function of the carburettor to prepare a mixture of air and petrol vapour in proper proportions for efficient combustion.

The fuel system of a petrol engine includes the fuel tank, the fuel pump, the fuel filters, the pipelines, the carburettor, the inlet manifold, the exhaust manifold, the exhaust pipe, the air cleaner, the silencer.

Fuel is taken out of the tank and delivered to the carburettor by the fuel pump. The carburettor atomizes the fuel and mixes it with air cleaned by the air cleaner. The inlet manifold distributes the mixture of air and fuel from the carburettor to the cylinders of the engine where it is burnt. The exhaust manifold collects the exhaust gases from the cylinders and leads them to a single exhaust pipe which discharges them into the air. The noise caused by the discharge of exhaust gases is usually reduced by the silencer.

Let's consider a simple carburettor. It consists of two parts:

1. The float chamber for regulating the entry of fuel to the carburettor.
2. The mixing chamber for atomizing fuel and mixing it with air.

In the float chamber there is a float with a needle attached to the top of the float. The end of this needle enters the hole through which the fuel comes into the chamber. Fuel is drawn away through the jet which is calibrated.

The mixing chamber has a venturi fitted on the end of the pipe leading to the inlet valve of the engine. The fuel discharge nozzle is fitted in the throat of the venturi.

Let us consider the operation of the carburettor. Fuel is entering the float chamber and rising in it. The float is also rising and lifting the needle. This stops the entry of fuel as soon as the needed level is reached. When the engine is running air is being drawn through the venturi causing a drop of pressure at the throat of the venturi. Due to this depression fuel is being drawn from the float chamber through the jet into the mixing chamber. The motion of air through the venturi is atomizing this fuel. Now the mixture of air and atomized fuel is being drawn into the engine.

The rate at which the combustible mixture is drawn into the engine depends upon the position of the throttle valve. The throttle valve regulates the engine power by controlling the air flow to the engine.

The simple carburettor described here is not suitable for use with modern motor-vehicle engines. Much more complicated carburettors are used for engines operating over a wide range of speeds and loads.

Active Vocabulary

1. to atomize - распылять
2. also - тоже, также
3. as soon as - как только
4. to calibrate - калибровать
5. to clean - очищать
6. to cause - вызывать
7. to collect - собирать
8. combustible - горючий
9. combustion сгорание
10. air cleaner - воздухоочиститель, воздушный фильтр
11. float chamber - поплавковая камера
12. mixing chamber - смесительная камера
13. complicated - сложный
14. to control - регулировать

15. to deliver - подавать
16. to depend on - зависеть от
17. depression - разрежение
18. drop - падение, понижение
19. to discharge - выпускать
20. to draw - втягивать, вытекать
21. due to - благодаря
22. to distribute - распределять
23. entry - поступление
24. float - поплавок
25. figure - цифра
26. flow - поток
27. fuel filter - топливный фильтр
28. jet - жиклер
29. to lead - направлять
30. to lift - поднимать
31. level - уровень
32. inlet manifold - впускной трубопровод
33. exhaust manifold - выпускной трубопровод
34. to need - требоваться
35. needle - игла
36. noise - шум
37. fuel discharge nozzle - распылитель
38. particularly - особенно
39. proper - правильный, надлежащий
40. fuel pump - топливный насос
41. exhaust pipe - выпускная (выхлопная) труба
42. pipeline - трубопровод
43. to rise - возрастать; подниматься
44. rate - скорость
45. range - диапазон
46. to regulate - регулировать

47. to show - показывать, демонстрировать
48. to stop - останавливать, ограничивать
49. suitable - подходящий, годный
50. silencer - глушитель
51. fuel tank - топливный бак
52. throat - горловина
53. venturi - диффузор
54. wide - широкий

Упражнение 5. ***Употребите глаголы, данные в скобках, в форме Present, Past или Future Continuous.***

1. When I entered the garage he (to clean) his car. 2. What you (to do)? - I (to fill) the fuel tank with petrol. 3. Where were you at 5 o'clock yesterday? I could not find you at home. - I was in the garage. My car didn't start, so I (to check) and (to clean) the fuel pump, the carburettor, the float needle and some other parts. 4. This professor (to collect) information, facts and figures on the proportion of public (общественный) and private (личный) transport in the country. 5. When they began the experiment, the temperature of the liquid (to rise). 6. Now many scientists (to work) at the problem of reducing air pollution. 7. Automobile engineers (to discuss) the problem of developing new engines with cleaner exhaust at their conference to-morrow.

Упражнение 6. ***Из приведённых слов и словосочетаний назовите те, которые обозначают детали топливной системы.***

connecting rod, fuel tank, exhaust manifold, poppet valve, fuel pump, valve guide, main journals, fuel filter, weight, cams, air cleaner, piston ring, inlet port, sprocket, push rod, silencer

Упражнение 7. ***Переведите следующие словосочетания.***

to depend on pressure; to depend on temperature; to depend on time; to depend on noise level; to depend on mixture; to depend on air flow; to depend

on the type of the engine; to cause noise; to cause temperature rise; to cause pressure drop; to cause depression; to cause the discharge of exhaust gases

<u>Упражнение 8.</u> Дайте возможные сочетания следующих прилагательных и существительных.

proper	range
exhaust	construction
combustible	use
complicated	pipe
wide	gas
correct	proportion
efficient	mixture
clean	combustion

<u>Упражнение 9.</u> Переведите слова и словосочетания, данные в скобках, и прочитайте предложения.

1. In early engines a large (количество) of heat was lost. 2. There are several types of fuel (фильтров). 3. When there is no fuel in the floating chamber (поплавок) is on the bottom of the chamber. 4. (Уровень) of fuel in the floating chamber at which the needle valve stops the entry of fuel is a little below the top of the fuel discharge nozzle. 5. To cause a flow of air into the engine the pressure inside the cylinder and (выходного трубопровода) must be reduced below atmospheric pressure. 6. When the engine is running at full (дроссель) the temperature of the exhaust gases may (достигать) 800°C or more. 7. Air cleaners are often combined with (глушителями) which reduce the noise caused by air flow through the carburettor. 8. Air which (проходить) into the carburettor may have a large (пропорция) of dust. 9. It is the function of the air cleaner (собирать) as much dust as possible.

Упражнение 10. ***Выразите своё согласие или несогласие со следующими утверждениями, употребляя фразы: "That's right", "That's wrong".***

1. Petrol is a fuel which is not suitable for use in motor vehicles. 2. When petrol is burnt it gives a large amount of heat. 3. In the mixing chamber there is a float with a needle attached to the top of the float. 4. The fuel discharge nozzle is fitted in the throat of the venturi. 5. The rate at which the mixture of air and atomized fuel is drawn into the engine does not depend on the position of the throttle. 6. The rate of air flow increases when the throttle is opened wide. 7. The purpose of the throttle valve is to regulate the engine power by controlling the air flow to the engine.

Упражнение 11. ***Постройте предложения, соединив их части, приведенные в колонках A и B***

A	B
1. Carburettor	1) discharges the exhaust gases into the air.
2. The exhaust manifold	2) prepares a mixture of petrol vapour and air in proper proportions for efficient combustion.
3. The silencer	3) regulates the entry of fuel to the carburettor.
4. The inlet manifold	4) delivers fuel from the tank to the carburettor.
5. The float chamber	5) reduces the noise caused by the discharge of exhaust gases.
6. The fuel pump	6) distributes the mixture of air and fuel from the carburettor to the cylinders of the engine.

7. The exhaust pipe	7) collects the exhaust gases from the cylinders and leads them to the exhaust pipe.
8. The throttle valve	8) controls the air flow to the engine.

Упражнение 12. ***Ответьте на вопросы по тексту 7 А.***

1. What fuel is particularly suitable for use in motor vehicles? 2. What is the main function of the carburettor? 3. What parts does the fuel system of a petrol engine include? 4. What is usually used to deliver fuel from the fuel tank to the carburettor? 5. What is an air cleaner used for? 6. Does the inlet manifold distribute the mixture of air and fuel to the cylinders of the engine? 7. What is the function of the exhaust manifold? 8. What is utilized to reduce the noise caused by the discharge of exhaust gases? 9. What two chambers does a simple carburettor consist of? 10. What chamber regulates the entry of fuel to the carburetter? 11. Where is the fuel discharge nozzle usually fitted? 12. How does the throttle valve regulate the engine power?

Text 7 B

Задание 1. ***Прочтите следующие слова и обратите внимание на их значение. Знание этих слов поможет Вам понять основное содержание текста.***

1. to combine - соединять(ся)
2. compound - соединение
3. carbon - углерод
4. dioxide - двуокись
5. hydrogen - водород
6. hydrocarbon - углеводород
7. insufficient - недостаточный
8. light - свет
9. lean mixture - бедная смесь
10. monoxide - одноокись
11. nitrogen - азот

12. noxious - вредный
13. oxide - окись
14. lubricating oil - смазочное масло
15. petroleum (crude oil) - нефть
16. ratio - отношение

Задание 2. ***Прочтите следующие интернациональные слова и переведите их.***

concentration, continent, kerosene, mass, portion, product, proportion, reaction

Задание 3. ***Прочитайте текст, стараясь понять основное содержание.***

Combustion of Fuels

Combustion is a chemical reaction in which light and heat are produced. In an internal combustion engine the chemical reaction takes place between the fuel and a portion of air with which it is mixed. Only heat is used in the engine. The products of the chemical reaction must be removed.

The principal source of present-day motor fuels is crude oil or petroleum. Petroleum was found on every continent and is produced in many countries. Petrol, kerosene, diesel fuel oil, lubricating oil are produced from petroleum.

Petrol is a clean liquid having hydrocarbons - compounds of hydrogen and carbon. When a hydrocarbon burns, hydrogen and carbon combine with the oxygen of the air. The combination of hydrogen and oxygen forms water which appears as vapour in the exhaust. Carbon combines with oxygen and forms carbon dioxide, a harmless gas if the concentration is not too great. In the engine the fuel never burns completely. As a result some other products are formed. The main noxious elements in the exhaust are hydrocarbons, carbon oxide and nitrogen oxides. Engines that are running with insufficient supply of air have higher percentage of carbon monoxide in their exhaust gases than the engines that are running with a correct supply of air.

The mass of air per pound (kg) of fuel in a mixture gives the air-fuel (A/F) ratio of the mixture. The A/F ratio for complete combustion - called the chemically correct mixture - is about 15 in the case of petrol. A mixture having a greater proportion of air - that is a higher A/F ratio than 15 - is a lean mixture. Mixtures having A/F ratios of less than 8 or more than 22 cannot be normally ignited in petrol engine cylinders.

The fuel system must vary the proportion of air and petrol depending on the various operating conditions.

Задание 4. ***Закончите предложения, выбрав из предложенных вариантов один, соответствующий содержанию текста.***

1. Present-day motor fuels are produced from a) coal; b) petroleum. 2. The combination of hydrogen and oxygen forms a) water; b) hydrocarbon. 3. Carbon monoxide is a) a poisonous gas; b) a harmless gas. 4. Engines which are running with insufficient supply of air have a) a low percentage of carbon monoxide; b) a high percentage of carbon monoxide. 5. A mixture having the A/F ration of higher than 15 is called a) a lean mixture; b) a rich mixture. 6. A mixture having the A/F ratio of less than 15 is called a) a chemically correct mixture; b) a rich mixture.

Задание 5. ***Ответьте на вопросы по тексту 7 В.***

1. What is produced as a result of combustion? 2. What chemical reaction takes place in an internal combustion engine? 3. What is the principal source of present-day motor fuels? 4. Is petroleum produced in many countries? 5. What is a hydrocarbon? 6. What does the combination of hydrogen and oxygen form? 7. What are the main noxious elements of the exhaust gases? 8. What mixture is called a chemically correct mixture? 9. What do we call a mixture having the A/F ratio of less than 15?

Оглавление