UNIT I

GRAMMAR: **to be** (БЫТЬ, ЯВЛЯТЬСЯ) **INDEFINITE TENSES**

PRESENT INDEFINITE (every day, always, usually)

I am	I am not	Am I?
He is	He is not	Is he?
She is	She is not	Is she?
It is	It is not	Is it?
We are	We are not	Are we?
You are	You are not	Are you?
They are	They are not	Are they?

PAST INDEFINITE (yesterday, last week, last month, a year ago)

I was	I was not	Was I?
He was	He was not	Was he?
She was	She was not	Was she?
It was	It was not	Was it?
We were	We were	Were we?
You were	You were not	Were you?
They were	They were not	Were they?

FUTURE INDEFINITE (tomorrow, next week, in some days)

I shall be	I shall not be	Shall I be?
He will be	He will not be	Will he be?
She will be	She will not be	Will she be?
It will be	It will not be	Will it be?
We shall be	We shall not be	Shall we be?
You will be	You will not be	Will you be?
They will be	They will not be	Will they be?

Упражнение 1

Вставьте глагол to be в Present Indefinite Active

1. I… a pupil. 2. My father … not a teacher, he … an engineer. 3. … your mother a doctor? –Yes, she …. 4. … they at home? – No, they … not at home, they … at the University. 5. My brother … a student. He … at the University. 6. … your sister an engineer? – No, she … not an engineer, she … a student.

7. We … at the English lesson. 8. The workers … at the factory. 9. His family … in Moscow. 10. This question … difficult. 11. I … not at the University, I … at home. 12. This story …interesting. 13. Russia…a very big country. 14. I…afraid of dogs. 15. My hands…clean. 16. The Volga…in Europe. 17. Motor-racing… a dangerous sport. 18. Diamonds…expensive.

Упражнение 2

Вставьте глагол to be в Present, Past или Future Indefinite Active

1. My father…a teacher. 2. He…a pupil twenty years ago. 3. We …engineers in five years. 4. My sister … not … at home tomorrow. 5. … you … at home tomorrow? 6. Yesterday we … at the University 7. My friend … in Moscow now. 8. He … in St. Petersburg tomorrow. 9. The river … long. 10. The students … at the lesson on physics now. 11. I … at home next Sunday. 12. We … pupils last year. 13. Anton Chekhov died in 1904. He…a famous Russian writer. 14. Today the weather…nice, but yesterday it… cold. 15. Don't buy those shoes. They…too expensive.

Упражнение 3

Составьте рассказ о себе и своей семье, используя глагол to be. Следующие вопросы помогут вам в составлении рассказа.

1. What is your name? 2. What is your surname? 3. How old are you? 4. Where and when were you born? 5. What town (city, settlement) are you from? 6. How large is your family? 7. What are your parents? 8. Do you have any sisters or brothers? 9. What are they? 10. What are the relations between the members of your family? 11. What are your household duties? 12. Do you have any hobbies? 13. What do you like or dislike doing? 14. How do you spend your free time? 15. Now you are a first-year student of the automobile transport faculty, aren't you? 16. Why did you enter this University, this faculty?

GRAMMAR: THERE + TO BE

There is …	There is no (not a) …	Is there …?
There are…	There are no (not any)	Are there …?
There was …	There was no (not a) …	Was there …?
There were …	There were no (not any)	Were there...?
There will be ...	There will be no (not be any)…	Will there be …?

Упражнение 4

Ответьте на следующие вопросы, обращая внимание на конструкцию there + to be

1. Are there many students in your group? 2. Are there are many Universities in your town? 3. Is there a concert hall in your city? 4. How many seasons are there in a year? 5. Are there seven days in a week? 6. Are there many classrooms in the University? 7. How many students were there at the English lesson yesterday? 8. Will there be a school in a new district of your town next year? 9. Is there a teacher in the classroom? 10. How many minutes are there in an hour?

GRAMMAR: INDEFINITE TENSES

PRESENT INDEFINITE ACTIVE

I work	I don't work	Do I work?
He, she, it work	He, she, it doesn't work	Does he, she, it work?
We work	We don't work	Do we work?
You work	You don't work	Do you work?
They work	They don't work	Do they work?

PAST INDEFINITE ACTIVE

I worked	I didn't work	Did I work?
He, she, it worked	He, she, it didn't work	Did he, she, it work?
We, you, they worked	We, you, they didn't work	Did we, you, they work?

FUTURE INDEFINITE ACTIVE

I will work	I will not work	Will I work?
He, she, it will work	He, she, it will not work	Will he, she, it work?
We, you, they will work	We, you, they will not work	Will we, you, they work?

Упражнение 5

Ответьте на вопросы, обращая внимание на формы глагола в Indefinite Tenses

1. Do you go to the University every day? 2. Do you study hard? 3. Does your friend study at the same faculty as you? 4. Do you go in for sports? 5. Does your friend go in for sports? 6. Do you live far from the University? 7. How long does it take you to get to the University? 8. How many classes do you have a day? 9. What do you do after classes? 10. When did you finish school? 11. Did you go abroad last year? 12. Did you spend your summer holidays in the country? 13. What exams will you take at the end of the semester? 14. When will you graduate from the University?

Упражнение 6

Раскройте скобки, употребив глагол в Present Indefinite Tense.

1. A student (buy) a lot of books at the beginning of each term. 2. The brake system (allow) the driver to slow or stop the car. 3. This car (belong) to Mr. Rich? 4. Every weekend she (get) into the car, (drive) to her country house and (work) in the garden. 5. What the term *frame* (mean)? 6. Anyone (know) where the dean is? 7. How long it (take) them to get here? 8. That shop (not sell) accessories for the car. 9. She (have) a car, but she (not use) it often. 10. The earth (go) round the sun. 11. How many cigarettes you (smoke) a day? 12. My car (not go) fast. 13. If you need money, why you (not get) a job? 14. Why you (not give up) smoking?

Упражнение 7

Раскройте скобки, употребив глагол в Past Indefinite tense.

1. I (not hear) the thunder during the storm last night because I (sleep). 2. My brother and sister (go) to the country by car yesterday. 3. I (get) into a car

accident last week. 4. The boy (fall down), but (not hurt) himself. 5. You (enjoy) your vacations last January? 6. I (share) a room with him when we were students. 7. When I (hear) the knock, I (go) to the door and (open) it. 8. How you (damage) the car so badly? 9. When you (marry)? – We (get) married two years ago. 10. Max (leave) the house for college, (get) on the bus and (get off) after some shops, (have) a sandwich in a cafe and (decide) to go back home. 11. They (not do) all the work yesterday. 12. During the early 1920's, the United States (make) about 90 per cent of the world's cars.

Упражнение 8

Раскройте скобки, используя Present или Future Indefinite tense.

1. I'm sure that I (recognize) him. 2. Their next concert (start) at 7 p.m.? 3. What you (do) when you (come) home? 4. If we (be) tired, we (stop) at a small village half-way to Moscow. 5. Before he (start) for London next month, he (spend) a day or two at a rest-home. 6. The engine (warm up) in a minute. 7. If you (not hurry), you (miss) the train. 8. She (not go) to the exhibition next Friday. 9. The child (not be) healthy if you (not give) him enough fruit. 10. When he (return) from Petersburg in a week, he (call) on us. 11. If it (rain), we (not go) to the country next week-end. 12. When you (leave) home for the university tomorrow?

Упражнение 9

Раскройте скобки, употребив глагол в Present, Past или Future Indefinite Tense.

1. Engine systems (provide) power for the car. 2. There were no automobiles in the past and life (seem) simpler and slower without them. 3. The number of traffic accidents (rise) in a few years? 4. She (not watch) TV every day. 5. When you (return) home yesterday? 6. My brother (go) to work every day. He (leave)

home at a quarter to eight. He (not take) a bus, he (prefer) to walk. Yesterday he (not go) to work and (get up) at 9 o'clock. 7. What you (buy) at the shop yesterday? 8. We (not spend) last summer in the country. 9. How you (spend) your next holidays? 10. My sister always (cook) dinner. 11. Kate (not write) letters every day. 12. Your father often (go) on business trips? 13. If you (translate) this article into Russian, I (use) it in my next report. 14. The car (not move) until you (start) the engine.

ТЕКСТ 1

AUTOMOBILE

internal-combustion engine – двигатель внутреннего сгорания
volatile fuel - легкоиспаряющееся топливо
average – средний
roughly – приблизительно
to divide – делить
basic – основной
body – кузов
storage space – место (для багажа)
molded steel – литая сталь
chassis – шасси
frame –рама
to support – поддерживать
axle assembles – узел оси
transmission – трансмиссия
steering mechanism – механизм управления
brakes – тормоза
suspension system – подвеска
to provide – обеспечивать
to mix – смешивать
combustion – сгорание
exhaust system – система выпуска выхлопных газов
muffler – глушитель
to reduce – уменьшать
noise – шум
lubrication system – система смазки
friction - трение
to wear out – изнашивать
cooling system – система охлаждения
overheating – перегрев
liquid coolant – охлаждающая жидкость
to comprise of – состоять из
coil – катушка
leaf spring – листовая рессора
shock absorber – амортизатор
tire – шина

device – устройство
vehicle – транспортное средство
windshield wipers – стеклоочистители
fuel system – топливная система
to cushion – смягчать
to cause – вызывать
surface – поверхность
tread – протектор
traction – тяга

AUTO, also called *MOTORCAR,* or *CAR,* is a usually four-wheeled automotive vehicle designed primarily for passenger transportation and commonly propelled by ***an internal-combustion engine*** using ***a volatile fuel***.

An ***average*** automobile is made of ***roughly*** 14,000 parts, which can ***be divided*** into several structural and mechanical subsystems.

The most ***basic*** of these is the ***body*** of the automobile, which contains the passenger and ***storage space*** as well as the engine compartment. It is usually classified according to the number of doors and the type of roof it has and is made of ***molded steel***, which is painted.

The body sits upon the ***chassis,*** a steel ***frame*** that also ***supports*** the engine, wheels, ***axle assemblies***, ***transmission, steering mechanism, brakes,*** and ***suspension members.***

Automobiles have complex electrical systems that consist of a storage battery, alternator, ***devices*** for starting the engine and for vehicle operation (*e.g.*, headlights and ***windshield wipers***), and such ***accessories*** as ***heaters*** and radios for passenger comfort and ***convenience***.

There are several other important subsystems. (Рис.1) The ***fuel system provides*** storage space for the fuel, transports it to the engine, and ***mixes*** it with air for combustion in the engine.

The ***exhaust system*** vents exhaust gases by way of a ***muffler***, which helps ***reduce*** engine ***noise.*** The ***lubrication*** system keeps ***friction*** from ***wearing out*** moving parts.

The ***cooling system*** keeps the engine from ***overheating,*** generally by means of ***liquid coolant***, although many engines are air cooled.

The ***suspension system, comprised of coil*** or ***leaf springs*** and ***shock absorbers,*** is combined with the ***tires to cushion*** the vehicle from the shock ***caused*** by driving over irregular ***surfaces.*** In addition, tires have a variety of ***tread*** designs to provide ***traction*** in all driving conditions.

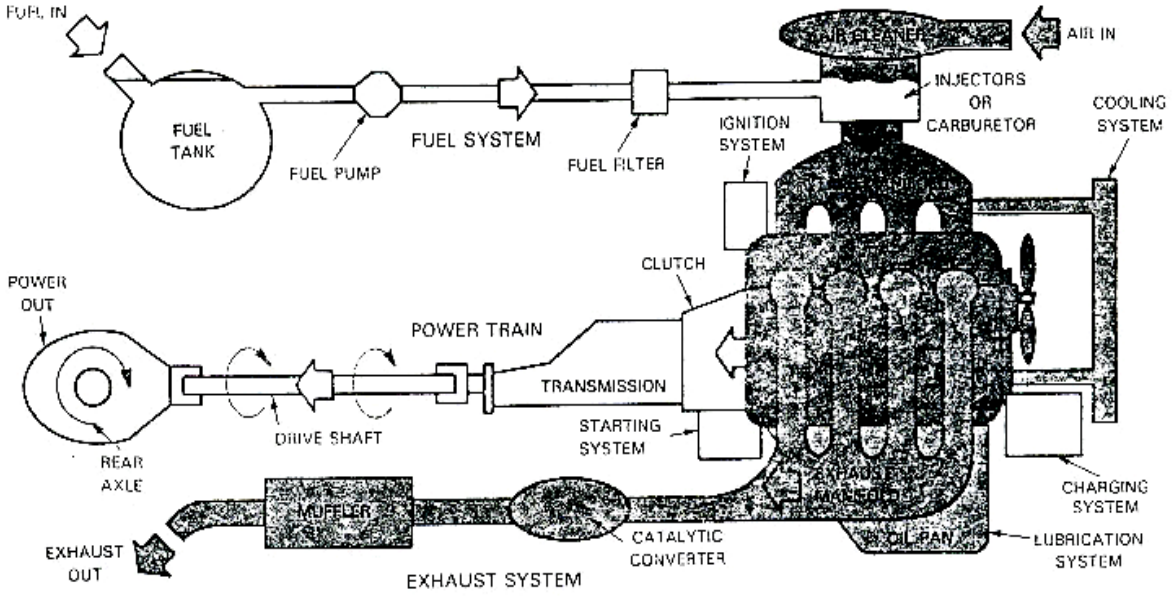

Рис.1

Упражнение 10

Ответьте на вопросы по тексту

1. What is the automobile? 2. What is auto propelled by? 3. Is auto made of many parts? 4. What is the most basic part of auto? 5. What does the body contain? 6. How is the body classified? 7. What is the body made of? 8. What does the body sit upon? 9. What does the frame support? 10. What other complex systems does the auto consists of? 11. What are the electrical devices of the car? 12. What are the accessories? 13. What is function of the fuel system? 14. What is the function of the exhaust system? 15. What is the lubrication system used for? 16. What is the function of the cooling system? 17. What does the suspension system comprise of?

Упражнение 11

Найдите в тексте английские эквиваленты к следующим словосочетаниям: четырехколесный автомобиль; место для двигателя; согласно чему-либо; количество дверей; для удобства пассажиров; выхлопные газы; посредством чего-либо; неровные поверхности; вдобавок; разнообразие рисунков протектора; условия вождения.

Упражнение 12

Переведите слова, данные в скобках, на английский язык

1. Automotive vehicle is commonly propelled by (двигатель внутреннего сгорания) using a volatile fuel. 2. (Обычный) automobile is divided into several structural and mechanical subsystems. 3. (Кузов) of the automobile contains the passenger and storage space and the engine compartment. 4. The body is usually made of (литой стали) 5.The body sits upon (шасси) and the frame supports the engine, wheels, (оси, механизм управления, тормоза) etc. 6. (Система выхлопа) vents exhaust gases by way of a muffler. 7.(Система смазки) keeps friction form wearing out moving parts 8.The cooling system keeps the engine from (перегрева) by means of liquid coolant. 9. (Подвеска) comprises of coil or leaf springs and (амортизатор).10. The suspension system is combined with (шинами) to cushion the vehicle from shock caused by driving over irregular surfaces. 11. (Глушитель) helps to reduce engine noise. 12. (Стеклоочистители) are the devices for vehicle operation.

Упражнение 13

Подберите определения к следующим терминам: axle, body, brake, chassis, engine, frame, muffler, motor vehicle, combustion, heater.

1. An energy-conversion device used to slow, stop or hold a vehicle or a mechanism. 2. A machine that converts heat energy into mechanical energy.

3. A theoretical or actual crossbar supporting a vehicle and on which one or more wheels turn. 4. The assembly of metal structural parts and channel sections that supports the car engine and body and is supported by wheels. 5. A vehicle propelled by a means other than muscle power, usually mounted on rubber tires, which does not run on rails or tracks. 6. In the exhaust system, a device through which the exhaust gases must pass to reduce noise. 7. The assembly of formed sections, together with window, doors, seats, that provides enclosures for the passengers, engine and luggage compartments. 8. The assembly of mechanism that makes up the major operating systems of the vehicle, usually everything except the car body. 9. A machine using for heating air or water. 10. The rapid burning of the air-fuel mixture in the cylinder.

ТЕКСТ 2

BODY AND CHASSIS

to serve – служить
covering – обшивка, покрытие
compartment – салон
sheet steel – листовая сталь
availability – доступность
fiberglass – стекловолокно
carbon-fibre – углеволокно
reinforced plastics – армированная пластмасса
property – свойство
separate – отдельный
to ride – ездить
smoothly – плавно
to prevent – предотвращать
leaning – наклон
excessively – чрезмерно
spring – пружина
bar – стержень
swivel join – поворотное соединение
arm – рычаг
damper – амортизатор
fluid – жидкость
pressure – давление
to resist – сопротивляться
rotation – вращение

The car body ***serves*** as a ***covering*** for the chassis and also forms the passenger ***compartment.***

Automotive body designs are categorized according to the number of doors, the arrangement of seats, and the roof structure.

Automotive bodies are generally made of ***sheet steel.*** Steel is used because of its general ***availability,*** low cost, and good workability. However, other materials, such as aluminum, ***fibreglass***, and ***carbon-fibre reinforced plastic***, are used because of their special properties.

The chassis generally includes everything but the car body. The term frame means a very strong, steel structure that supports the other components of the car. Some cars have a frame ***separate*** from the body. Many cars use the internal body structure as a frame.

The ***suspension system*** lets the car's wheels move up and down with little and no body movement. This helps the car ***ride smoothly*** and safely. The suspension system must also ***prevent*** the car from ***leaning excessively*** in turns. Various ***springs, bars, swivel joints, arms*** and ***damper*** make up the suspension system.

The ***steering system*** allows the driver to control vehicle direction by turning the front wheels right or left. It uses a series of gears, swivel joints and rods.

The ***brake system*** produces friction to reduce speed or to stop the car. When the driver presses the brake pedal, ***fluid pressure*** expands the brake mechanism on each wheel. The brake mechanism then produces friction that ***resists*** wheel ***rotation.***

Упражнение 14

Ответьте на вопросы по тексту

1. What does the car body serve for? 2. What does the body design depend on? 3. What are the automotive bodies made of? 4. What are the advantages of the steel? 5. What are the other materials used for the body? 6. What does the term "frame" mean? 7. What is the function of the suspension system? 8. What are

the components of the suspension system? 9. What is the steering system used for? 10. What does the steering system use to turn the front wheels right or left? 11. What is the function of the brake system? 12. How does the stopping of the car occur?

Упражнение 15

Переведите слова, данные в скобках, на английский язык.

1. The car body (служит) as a covering for the chassis and forms the passenger (салон). 2. Automobile bodies are generally made of (листовой стали). 3. Aluminum, (стекловолокно) are used because of their special properties. 4. Steel is used because of its general (доступности), low cost and good workability. 5. Some of the cars have a frame (отдельную) from the body. 6. The suspension system helps the car ride (плавно) and safely. 7. To prevent the car from (наклона) excessively in turns, the suspension system is used. 8. (Система управления) allows the driver to control vehicle direction. 9. Various (пружины), (стержни), swivel joints and arms make up the suspension system. 10. To reduce speed or to stop the car, the brake system produces (трение). 11. When the driver presses the brake pedal, (давление жидкости) expands the brake mechanism on each wheel. 12. The brake mechanism produces friction that (сопротивляется) wheel rotation.

GRAMMAR: **INDEFINITE TENSES PASSIVE**

to be + Participle II

PRESENT INDEFINITE PASSIVE

I **am asked**	I **am not asked**	**Am** I **Asked**?
He, she it **is asked**	He, she, it **is not asked**	**Is** he, she, it **asked**?
We, you, they **are asked**	We, you, they **are asked**	**Are** we, you, they **asked**?

PAST INDEFINITE PASSIVE

I, he, she it **was asked**	I, he, she, it **was not asked**	**Was** I, he, she, it **asked?**
We, you, they **were asked**	We, you, they **were not asked**	**Were** we, you, they **asked?**

FUTURE INDEFINITE PASSIVE

I, we He, she, it **will be** You, they **asked**	I, we He, she, it **will not** You, they **be asked**	I, we **Will** He, she, it **be** You, they **asked**?

Упражнение 16

Переведите предложения, обращая внимание на глаголы в Indefinite Passive.

1. The rapid changes in the society were created by the development of automobiles at the beginning of the 20th century. 2. The four wheeled automotive vehicle designed for transportation of passengers is called a car. 3. A motor vehicle is commonly propelled by an internal combustion engine using a volatile fuel. 4. The shock was caused by driving over irregular surfaces. 5. The engine noises are reduced by a muffler in the exhaust system. 6. Heat energy is converted into mechanical energy by the engine. 7. These new heaters and radios will be used on the cars for passenger comfort and convenience. 8. The majority of automobile parts are divided into several structural and mechanical subsystems. 9. All the bodies made of molded steel will soon be painted and treated to retard corrosion. 10. Automobile body designs are categorized according to the number of doors, the arrangement of seats and roof structure. 11. Steel is used because of its availability, low cost and workability. 12. The burnt gases will be pushed out the exhaust port and into the exhaust system.

Упражнение 17

Поставьте глаголы, данные в скобках, в Present, Past или Future Indefinite Tenses Active или Passive

1. The letter from parents (to receive) yesterday. 2. I (to send) to Moscow next weekdays. 3. Almost all the students (to ask) at the lesson yesterday. 4. A very important book (to find) at last at the library last Friday. 5. Many cars (to produce) in our town every year. 6. The new experiment (to do) tomorrow. 7. These texts (to translate) at the last lesson without a dictionary. 8. That car (to test) last autumn. 9. The exams usually (to pass) in winter and in summer. 10. We (to invite) to an exhibition of modern auto transport technology last Saturday. 11. She (to give) a new task tomorrow. 12. Many problems (to considered) at the last conference in London.

Упражнение 18

Раскройте скобки, употребляя глаголы в одной из форм Indefinite Active или Passive.

1. The problem will (solve, be solved) at the meeting on Friday. 2. Your colleagues will (solve, be solved) all the important problems next week. 3. You may (park, be parked) your car there, a hundred meters from the bus-stop. 4. Her car can (park, be parked) in any place here. 5. From the laboratory, the results will (take, be taken) straight to the plant. 6. Tomorrow he will (take, be taken) all the results of this experiment from our laboratory. 7. At the airport they will (meet, be met) by a man from our plant immediately. 8. She will (meet, be met) us right in the Automobile Centre.

ТЕКСТ 3

ENGINE

to consume – потреблять
gasoline – бензин
expansion – расширение
heat – теплота
to locate – располагаться
bored (machined) – расточенный
to guide –направлять
piston – поршень
to transfer – превращать
connecting rod – шатун
rings – кольца (поршневые)
to seal – герметизировать
gap – зазор
leaking – протекание
to link – соединять
crankshaft – коленчатый вал
rotary (spinning) motion – вращательное движение
reciprocating motion – возвратно-поступательное движение
cylinder head – головка цилиндра
valve – клапан
rocker arm – клапанное карамысло
camshaft – распределительный вал
combustion chamber – камера сгорания
cavity (enclosed area) – полость
to occur – случаться, происходить
valve spring – пружина клапана
lifter – толкатель
valve train – клапанный механизм
flywheel – маховое колесо

The engine provides the energy to move the car and operate the other systems. Most car engines ***consume*** gasoline or diesel fuel. The fuel burns in the engine to produce heat. The ***heat*** causes ***expansion*** and pressure. The pressure can then be used to move the parts of the engine and produce power

An engine is usually ***located*** in the front of the chassis. A few cars have the engine mounted in the rear.

The basic parts of a one-cylinder engine (рис.2) are:

1. The ***block*** (holds all of the other engine parts).
2. The ***cylinder*** (a round hole ***bored*** in the block. It ***guides*** piston movement).
3. The ***piston*** (***transfers*** the energy of combustion to the ***connecting rod)***.

4. The ***rings*** **(*seal*** the small ***gap*** around the sides of the piston. They keep combustion pressure and oil from ***leaking*** between the piston and cylinder wall).

5. The ***connecting rod (links*** the piston to the crankshaft).

6. The ***crankshaft*** **(**changes the ***reciprocating*** motion of the piston and rod into useful ***rotary*** motion).

7. The ***cylinder head (***covers and seals the top of the cylinder. It also holds the valves, rocker arms, and sometimes, the camshaft).

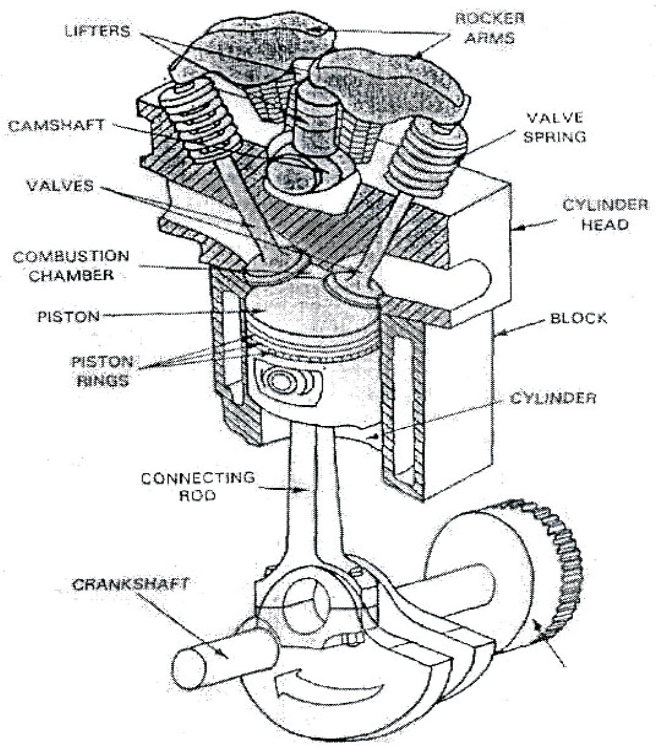

Рис.2

8. The ***combustion chamber*** (a small ***cavity*** between the top of the piston and the bottom of the cylinder head. The burning of the air-fuel mixture ***occurs*** in the combustion chamber).

9. The ***valves*** (open and close to control the flow of fuel mixture into and exhaust out of the combustion chamber).

10. The ***camshaft (***controls the opening of the valves).

11. The ***valve springs*** (keep the valves closed when they do not need to be open).

12 .The ***rocker arms*** (transfer camshaft action to the valves).

13. The ***lifters*** *(*ride on the camshaft and transfer motion to the other parts of the valve train).

14. The ***flywheel*** (helps keep the crankshaft turning smoothly).

Упражнение 19

Постройте предложения, соединив их части, приведенные в колонках.

A	B
1.The block	a) holds all of the other parts of the engine.
2.The camshaft	b) is a round hole machined in the engine.
3.The connecting rod	c) transfers the energy of combustion to the connecting rod.
4.The combustion chamber	d) seal the small gap around the sides of the piston.
5.The cylinder	e) links the piston to the crankshaft.
6.The crankshaft	f) open and close to control the flow of fuel mixture into and out of the combustion chamber.
7.The flywheel	g) controls the opening of the valves.
8.The piston	h) changes the reciprocating motion of the piston into the rotary motion.
9.The rings	i) helps keep the crankshaft turning smoothly.
10.The valves	j) is a small enclosed area between the top of the piston and the bottom of the cylinder head.

Упражнение 20

Ответьте на вопросы по тексту

1. What is the function of the engine? 2. What fuel do most car engines consume? 3. What does the heat produced by burning the fuel in the engine cause? 4. What can the pressure be used for? 5. Where is the engine usually located? 6. What are the main engine parts? 7. What is the function of the cylinder head? 8. What are the valve springs used for? 9. What is the function of the rocker arms? 10. What are the lifters used for?

Упражнение 21

Поставьте глаголы, данные в скобка, в Present Indefinite Active или Passive.

1. The block (to hold) all of the engine parts. 2. Gasoline (to consume) by most cars. 3. The engine (to provide) the energy to move the car. 4. An average automobile (to make) of 14000 parts. 5. The reciprocating motion of the piston

(to change) into the rotary motion by the crankshaft. 6. The fuel (to burn) in the engine to produce heat. 7. The crankshaft action (to transfer) to the valves by the rocker arms. 8. The automobile parts (to divide) into several structural and mechanical subsystems. 9. The frame (to support) the engine, wheels, the steering mechanism, the brake, the suspension and other systems. 10. Electrical system (to consist of) the battery, the generator, heaters, radios. 11. Most of the engines (to cool) by liquid coolant, but some of them (to cool) by air. 12. The cooling system (to keep) the engine from overheating. 13. Automobile bodies (to classify) according to the number of doors, the arrangement of seats, and the roof structure. 14. The chassis (to include) everything but the car body. 15. Automobile bodies (to make) of sheet steel. 16. Steel (to use) because of its availability, low cost, and good workability. 17. The brake system (to produce) friction to reduce speed or to stop the car.

ТЕКСТ 4

FOUR – STROKE CYCLE

to require – требовать
top dead centre – верхняя мертвая точка
bottom dead centre – нижняя мертвая точка
stroke – такт, ход поршня
intake stroke – такт впуска
compression stroke – такт сжатия
power stroke – рабочий ход
exhaust stroke – такт выпуска
to draw – всасывать
intake valve – впускной клапан
exhaust valve – выпускной клапан
to slide – скользить
to form – формировать
mixture – смесь
to squeeze – сжимать
combustible – горючий
tremendous – огромный
spark plug – свеча зажигания
to ignite – зажигать
since – так как
to remove – отводить
charge – заряд
port – окно
complete – полный
to complete – завершать
revolution – оборот

low pressure area – область низкого давления

to push – толкать

to run – работать

to happen – происходить

The ***four-stroke cycle requires*** four piston strokes to complete one cycle. Every four strokes, the engine produces one power stroke. The stroke is the movement of the piston from one dead centre to another. The highest position of the piston is called ***top dead centre***, the lowest is ***bottom dead centre***. Almost all automobiles use four-stroke cycle engines. (рис. 3)

The ***intake stroke of a gasoline engine draws fuel and air into the engine. The intake*** valve is open and the ***exhaust valve*** is closed. The piston ***slides*** down and ***forms*** a ***low pressure area*** or vacuum in the cylinder. Outside air pressure then ***pushes*** the air-fuel mixture into the engine.

The ***compression stroke squeezes*** the air-fuel mixture to prepare it for combustion. The mixture is more ***combustible*** when pressurized. During this stroke, the piston slides up with both valves closed.

The ***power stroke*** burns the air-fuel mixture and pushes the piston down with ***tremendous*** force. This is the only stroke that does not consume energy. It produces energy. When the ***spark plug*** fires, it ***ignites*** the fuel mixture. ***Since*** both valves are still closed, pressure forms on the top of the piston. The piston is forced down, spinning the crankshaft.

The ***exhaust stroke removes*** the burned gases from the engine and gets ready the cylinder for a fresh ***charge*** of air and fuel. The piston moves up. The intake valve is closed and the exhaust valve is open. The burned gases are pushed out the exhaust port and into the exhaust system.

The crankshaft makes ***two revolutions*** of the crankshaft ***to complete*** the four-stroke cycle.

When the engine ***is running,*** these series of events ***happen*** over and over very quickly.

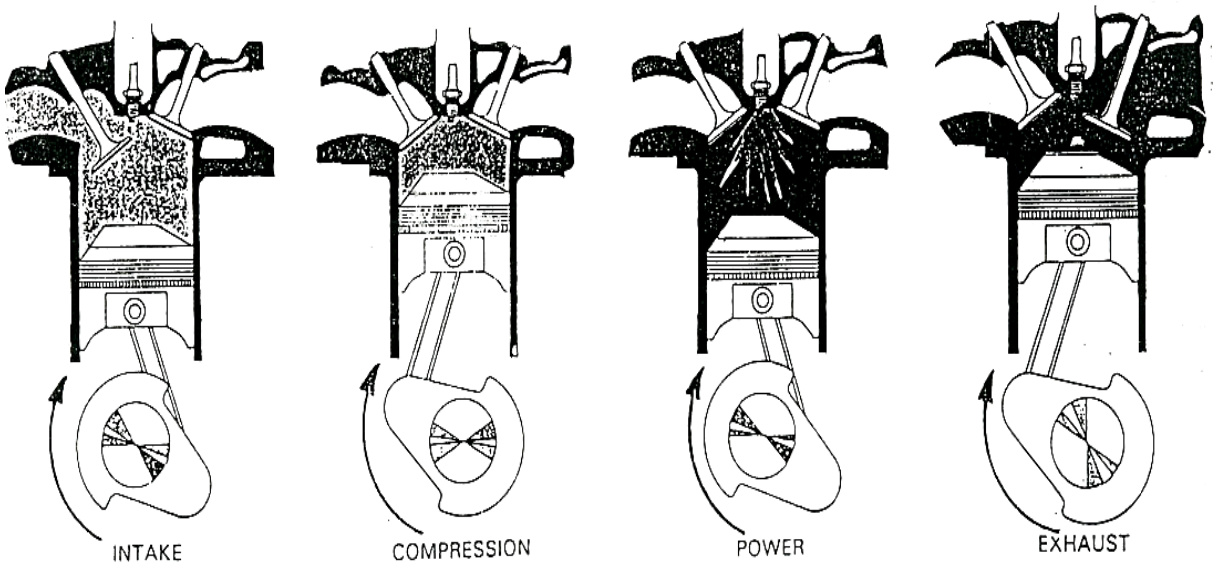

Рис. 3

Упражнение 22

Ответьте на вопросы по тексту

1. What four strokes are completed during one cycle of the engine operation? 2. During what stroke do the fuel and air enter the cylinder? 3. What valve is open and what is closed during intake stroke? 4. During what stroke is the air-fuel mixture squeezed to be prepared it for the combustion? 5. During what strokes are both valves closed? 6. What stroke doesn't consume energy? 7. What ignites the air-fuel mixture? 8. Where does pressure form during the power stroke? 9. What happens during the exhaust stroke? 10. What valve is open during exhaust stroke? 11. How many revolutions does the crankshaft do to complete the four-stroke cycle?

Упражнение 23

Переведите слова в скобках на английский язык.

1. To complete one cycle the four-stroke cycle (требует) four piston strokes.

2. The stroke is a movement of the piston from (верхней мертвой точки) to (нижней мертвой точки). 3. The fuel is drawn into the engine during (такта впуска). 4. During the intake stroke the piston (скользит) down and forms a low pressure area. 5. Outside air pressure (толкает) the air-fuel mixture into the engine. 6. The air-fuel mixture (сжимается) during the compression stroke. 7. During the compression stroke and (рабочего хода) both (клапана) are closed. 8. When pressurized the mixture is more (горючая). 9. (Огромная) force pushes the piston down the cylinder. 10. (Свеча зажигания) fires and ignites the fuel mixture. 11. To complete the four-stroke cycle the crankshaft makes two (оборота). 12. During the exhaust stroke (впускной) valve is closed and (выпускной) valve is open. 13. When the engine is running the series of strokes (происходит) over and over very quickly.

Упражнение 24

Опишите четырехтактный цикл, заполнив таблицу.

	intake	compression	power	exhaust
Air-fuel mixture		Is squeezed		
Intake valve	Is open			
Location of piston				Moves up
Exhaust valve			Is closed	

GRAMMAR: TYPES OF QUESTIONS

GENERAL (общий) **QUESTION**

Вспомогательный, модальный глагол	Подлежащее	Сказуемое	Дополнение	Обстоятельство
Did	you	Send	him a letter	yesterday?
Can	he	Answer	my question	today?

Ответ:Yes,… No,…

ALTERNATIVE (альтернативный) **QUESTION**

Вспомогательный, модальный глагол	Подлежащее	Знаменательная часть сказуемого	Союз	Вспомога-тельный, модальный глагол	Подлежащее	Знаменательная часть сказуемого
Will	she	read	or	(will)	(she)	write?
Can	you	skate	or	(can)	(he)	ski?

Ответ: одна из частей вопроса

DISJUNCTIVE (разделительный) **QUESTION**

Утвердительное\отрицательное предложение + вопросительное предложение

Подлежащее	Сказуемое	Дополнение	Вспомогательный глагол	Подлежащее
You	know	it well,	don't	you?
I	can go	now,	can't	I?
He	is not	a doctor	is	he?

Ответ: Yes, I do. Yes, you can. No, he is not.

SPECIAL (специальный) **QUESTION**

Вопросительное слово	Вспомогательный глагол	Подлежащее	Знаменательная часть сказуемого	Дополнение
Whom	does	the University	train?	
What	do	you	know	about it?

Вопрос к подлежащему

подлежащее (вопросительное слово)	сказуемое	дополнение	обстоятельство
Who	knows	English	well?
What	helped	you?	

Вопросительные слова:

Who? – кто? What? – что, какой? How often? – как часто?

Where? – где? Why? – почему? How much (many)? – сколько?

Whom? - кого, кому? When? – когда? How long? - сколько по времени?

Whose? – чей? How? – как?

Упражнение 25

Составьте 4 типа вопросов к каждому предложению.

1. Japan's major car producers include Nissan Motor Company, Honda Motor Company, and Mazda Motor Corporation. 2. Accessories increase passenger comfort and convenience. 3. He learnt to drive a car two years ago. 4. The automobile became one of the main forms of transportation in the twentieth century. 5. The brake system stops the car. 6. Millions of cars move on the roads of Russia. 7. They will graduate from the University in a year. 8. The motor race will take place tomorrow. 9. Dr. Otto described a four-stroke cycle in 1875. 10. These students will become qualified engineers soon. 11. People called the first automobiles "horseless carriages".

UNIT II

ТЕКСТ 1

FUEL SYSTEM

to provide – обеспечивать
efficient – эффективный
to add – добавлять
amount – количество
to assure – гарантировать
volatile – летучий
air-fuel ratio – воздушно-топливное отношение
to alter – изменять
condition – положение, состояние, условие
fuel tank –топливный бак
common – простой, обыкновенный
suction – всасывание, подсос
to deliver – подавать
intake manifold – впускной коллектор
throttle valve – дроссель
gas pedal – педаль газа
to press – нажимать
to pull –тянуть
to draw – втягивать

The fuel system must ***provide*** the correct mixture of air and fuel for ***efficient*** engine operation. It must ***add*** the right ***amount*** of fuel to the air

entering the cylinder. This ***assures*** that a very ***volatile*** (***burnable***) mixture enters the combustion chamber.

The fuel system must also ***alter*** the ***air-fuel ratio*** (percentage of air and fuel) with changes in operating ***conditions*** (engine temperature, speed, load).

There are three basic types of automotive fuel systems: carburetor, gasoline injection, and diesel injection. The gasoline types (carburetor and gasoline injection) are the most ***common.***

The ***carburetor fuel system*** uses engine vacuum (***suction***) ***to draw*** fuel out of ***the tank*** and ***delivers*** it to the carburetor. The engine's intake strokes form a vacuum inside ***the intake manifold*** and carburetor. This causes gasoline to be drawn from the carburetor and into the engine.

The carburetor ***throttle valve*** (air valve) is connected to the driver's ***gas pedal.*** When the pedal ***is pressed***, the throttle valve opens. This allows more air to flow through the carburetor, ***pulling*** more fuel into the air. The throttle can be opened or closed to control engine speed and power output.

Упражнение 1

Ответьте на вопросы по тексту

1. What is the function of the fuel system? 2. What is the air-fuel ratio? 3. What the operating conditions does the air-fuel ratio depend on? 4. What are three basic types of automotive fuel systems? 5. What types of the fuel system are the most common? 6. What does the carburetor fuel system use to draw fuel into the engine? 7. What causes gasoline to be drawn from the carburetor into the engine? 8. What is the carburetor throttle valve connected to? 9. What happens when the gas pedal is pressed?

Упражнение 2

Переведите слова, данные в скобках, на английский язык

1. The fuel system must provide the correct air-fuel mixture for (эффективной) engine operation. 2. The fuel system must (добавлять) the right (количество) of fuel to the air entering the cylinder. 3. The fuel system must alter (воздушно-топливное отношение) with changes in operating (условиях). 4. The most (распространенные) types of the fuel system are the gasoline types. 5. To draw fuel into the engine, the carburetor fuel system uses (всасывание). 6. A vacuum is formed inside the (впускного коллектора) and carburetor.7. (Дроссель) is connected to the driver's gas pedal. 8. When (педаль газа) is pressed, the throttle valve opens. 9. Open throttle valve allows more air to flow through the carburetor and (затягивает) more fuel into the air.

Упражнение 3

Поставьте вопросы к выделенным словам

1. The fuel system must provide the air-fuel mixture for efficient engine operation. (2) 2. The carburetor throttle valve is connected to the driver's gas pedal. (2) 3. In the mid-1800s Etienne Lenoir developed a crude two-stroke cycle internal-combustion engine (3) 4. In Germany in 1879 a successful internal-combustion engine was constructed by Nikolaus Otto. (3) 5. The automobiles give people the freedom to live, work and travel wherever they wanted. (3) 6. Every four strokes, the engine produces one power stroke. (2) 7. When the engine ***is running,*** these series of events ***happen*** over and over very quickly.

GRAMMAR: DEGREES OF COMPARISON OF ADJECTIVES

cold busy	cold**er** busi**er**	**the** cold**est** **the** busi**est**
active difficult	**more** active **more** difficult	**the most** active **the most** difficult
good **bad** **little** **much, many** **far**	**better** **worse** **less** **more** **farther, further**	**the best** **the worst** **the least** **the most** **the farthest, the furthest**

Упражнение 4

Образуйте степени сравнения прилагательных и наречий

Sad, happy, big, large, far, good, bad, fast, slow, new, old, unusual, brilliant, little, small, low, high, heavy, expensive, cheap, famous, remarkable, hot, busy, complicated, modern, interesting.

Упражнение 5

Переведите предложения на английский язык

1. Грузовик перевозит более тяжелые грузы, чем легковой автомобиль. 2. Этот механик самый опытный в автомастерской. 3. Двигатель Отто был более эффективным, чем двигатель Ленуа. 4. Какой вал больше, коленчатый или распределительный? 5. В Америке находятся одни из самых крупных автозаводов. 6. Кузов этого современного автомобиля кажется шире, чем кузов предыдущей модели. 7. Как называется самый важный компонент в автомобиле? 8. Автомобиль с новым двигателем движется быстрее, чем со старым. 9. Для проверки электрооборудования ему понадобилось меньше времени, чем в прошлый раз. 10. Дорога, по которой мы едем, худшая дорога в районе. 11. Если вы замените поршневые кольца, машина дольше вам прослужит.

ТЕКСТ 2

FUEL INJECTION SYSTEM

engine sensors – датчики двигателя
to meter – измерять
fuel pump – топливный насос
to keep – удерживать
data – данные
airflow – поток воздуха
to hold – удерживать
to allow – позволять
to spray – распылять
to force – нагнетать, форсировать
combustion chamber – камера сгорания
instead – вместо этого
extremely – чрезвычайно
to expand – расширять

Gasoline injection. Modern gasoline injection systems use a computer, ***engine sensors*** and electrically operated injectors (fuel valves) ***to meter*** fuel into the engine. An electric ***fuel pump*** keeps a constant fuel pressure at the injectors. The computer, depending upon electrical ***data*** from the sensors, opens the injectors for the correct amount of time. Fuel ***sprays*** into and mixes with the air entering the combustion chambers.

Like a carburetor, a throttle valve is used to control ***airflow***, engine speed and engine power. When the throttle valve is open, the computer ***holds*** the injectors open longer, ***allowing*** more fuel ***to spray out***. When the throttle is closed, the computer opens the injectors for only a shot period of time.

Diesel injection. A diesel fuel system is a mechanical system that ***forces*** diesel oil (not gasoline) directly into the ***combustion chamber***. ***Instead,*** it uses ***extremely*** high compression stroke pressure to heat the air in the combustion chamber. The air is squeezed until it is hot enough to ignite the fuel.

When the mechanical pump sprays the diesel fuel into the combustion chamber, the hot air causes the fuel to begin to burn. The burning fuel ***expands*** and forces the piston down on the power stroke.

Упражнение 6

Ответьте на вопросы по тексту:

1. What are the main injection systems? 2. What devices does a gasoline injection system use to meter fuel into the engine? 3. What is an electric fuel pump used for? 4. What is the function of the computer in gasoline injection system? 5. What is a throttle valve used for? 6. What happens when the throttle valve is open and closed? 7. What is a fuel diesel system? 8. Does a diesel system use spark plugs? 9. How is the air in the combustion chamber heated?

Упражнение 7

Найдите в тексте английские эквиваленты к следующим словосочетаниям: работающие на электричестве; постоянное топливное давление; зависящий от; на определенный промежуток времени; удерживает инжектор открытым дольше; пока достаточно теплоты; является причиной загорания топлива.

Упражнение 8

Переведите слова, данные в скобках, на английский язык.

1. Gasoline injection systems use (компьютерные датчики двигателя), fuel valves (чтобы измерить) fuel into the engine. 2. The computer depends upon (данные) from the sensors. 3. Fuel (впрыскивается) into and mixes with air entering the combustion chamber. 4. (Дроссель) is used to control (поток воздуха), engine speed and engine power. 5. A diesel fuel system (нагнетает) diesel oil directly into (камеру сгорания). 6. A diesel engine does not use (свечу зажигания) like a gasoline engine. 7. The air (сжимается) until it is hot is enough to ignite the fuel. 8. When (механический насос) sprays the diesel fuel into combustion chamber, the hot air (приводит к тому, что) the fuel to begin to burn. 9. The burning fuel (расширяется) and forces (поршень) down

on the power stroke. 10. A diesel engine uses high compression stroke (давление) to heat the air into the combustion chamber.

ТЕКСТ 3

CARBURETOR PROBLEM DIAGNOSIS

to determine – определять
at fault – поврежденный
emission control system – система контроля выделения выхлопных газов
missing – недостаточный
clue – подсказка
to remove – снимать
to look for – искать
air cleaner – воздухоочиститель
leakage – утечка
sticking choke – заедание заслонки
hose – шланг
converting – изменение
adjustment – регулировка
the rest – остальное
wire – провод
hissing sound – шипение
to make sure – убедиться
distributor cap – крышка распределителя
cracked – растресканный
lean mixture – бедная смесь
to miss – глохнуть, не заводиться
screw adjustment – регулировка винтом
clogged passage – засоренный канал
float – поплавок
rich mixture – богатая смесь
to roll – кренить
to lope – двигаться не равномерно
to emit – выделять
air bleed – воздухоотвод
restricted – суженный

The first step in diagnosis is ***to determine*** whether the carburetor or another system is ***at fault.*** Troubles in the ignition system, emission control systems and engine can produce the same general symptoms (***missing***, poor fuel economy, engine not starting) as carburetor problems.

Visually inspect carburetor. A visual inspection of the carburetor may provide ***clues*** to the carburetor problem. ***Remove*** the air cleaner. ***Look for*** fuel

leakage, ***sticking choke*** or disconnected vacuum ***hoses*** or any other obvious troubles.

A heavy ***converting*** of road dirt usually indicates the carburetor has been in service for a long time. ***Adjustments*** or repairs may be needed.

While inspecting the carburetor, also check ***the rest*** of engine compartment. Look for disconnected ***wires*** and hoses. Listen to ***the hissing sound*** of a vacuum leak. ***Make sure the distributor cap*** is not ***cracked***. Try to locate anything that could upset normal engine operation.

Incorrect air-fuel mixture. Many internal carburetor problems show up as an air-fuel mixture that is too rich or too lean.

A lean air-fuel mixture is caused by any condition that allows too much air and too little fuel to enter the engine. A lean mixture will cause the engine to ***miss*** every once in a while. The cause may be a vacuum leak, incorrect mixture ***screw*** adjustment, ***clogged fuel passage***, low ***float*** level, or other problems.

A rich air-fuel mixture results from too much fuel and not enough air entering the engine. A very rich mixture will make the engine ***roll, lope*** and ***emit*** black smoke. A clogged ***air bleed***, ***restricted*** air filter, high float level, incorrect choke setting, or other carburetor troubles can produce a rich mixture.

Упражнение 9

Ответьте на вопросы по тексту

1. What is the first step in diagnosis of the carburetor problems? 2. What are the symptoms of the carburetor problems? 3. What may a visual inspection provide? 4. What troubles should you look for in a carburetor? 5. What does a heavy converting of the road mean? 6. Should you check the engine compartments, while inspecting the carburetor? 7. What sound can be caused by a vacuum leak? 8. What is a lean mixture caused by? 9. What will a lean mixture cause?

10. What does a rich air-fuel mixture result from? 11. What troubles will a rich mixture make? 12. What carburetor problems can produce a rich mixture?

Упражнение 10

Найдите в тексте английские эквиваленты к следующим словосочетаниям: те же самые, общие симптомы; плохая экономия топлива; визуальный осмотр; очевидные повреждения; что-нибудь, что могло бы расстроить; слишком богатая смесь; высокий уровень поплавка; неправильная посадка заслонки.

Упражнение 11

Переведите слова, данные в скобках, на английский язык.

1. (Определить) if the carburetor or another system is at fault is the first step in carburetor problems diagnosis. 2. A visual inspection of the carburetor provides (подсказку) to the carburetor problem. 3. (Снимите) the air cleaner and (ищите) fuel leakage, sticking choke, binding linkage or other symptoms. 4. While inspecting the carburetor look for disconnected (провода) and (шланги). 5. (Убедитесь) the distributor cap is not cracked. 6. (Бедная смесь) is caused by any condition that allows too much air and too little fuel to enter the engine. 7. The cause may be a vacuum leak, incorrect mixture screw adjustment (засоренные топливные каналы), low float fuel. 8. (Богатая смесь) results from too much fuel and not enough air entering the engine. 9. A very rich mixture will make the engine (крениться), (двигаться неправильно) and emit black smoke. 10. A rich mixture can be produced by incorrect choke setting, high float level, (суженные) air filter a clogged (воздухоотвод).

ТЕКСТ 4

DIESEL INJECTION MAINTENANCE

maintenance – техническое обслуживание
to involve – включать в себя
to detect – определять
cardboard – картон
fitting – соединительная часть
to replace – заменить
final filter screen – сетка фильтра тонкой очистки
fuel line – трубопровод подачи топлива
injector assemblies – форсунка в сборе
performance – работа
to bleed off – сливать
drain – спускное отверстие
trapped water – вода в отстойнике
pitting – точечная коррозия
flammable – воспламеняющийся
intake manifold – впускной коллектор
safety – безопасность
hazard – опасность
to pose – создавать
safety precaution – меры предосторожности
to attempt – пытаться
to squirt out – брызгать
to remove – снимать
to puncture – прокалывать
blindness – слепота
injury – травма
to suck rag – засасывать тряпки (одежду)

Refer to a service manual for details on periodic ***maintenance*** of a diesel injection system. You will need to change or clean filters periodically. Maintenance also ***involves*** inspecting the system for signs of trouble.

If you ***detect*** signs of fuel leakage, use a piece of ***cardboard*** to find the leak. Move the cardboard around each ***fitting***. If there is a serious leak, it will strike the cardboard and not your hand. ***Replace*** any injection line or return hose that is not in perfect condition.

Fuel filters are normally located in the fuel tank, in the fuel line (main filter), and sometimes in ***the injector assemblies*** (final filter screens). For good ***performance***, it is very important that these filters be kept clean. The main fuel filter may have ***a drain.*** The drain can be used ***to bleed off trapped water.*** When

mixed with diesel oil, water causes rapid corrosion and ***pitting*** of injection system components.

DIESEL INJECTION SERVICE SAFETY

1. Even though diesel fuel is not as flammable as gasoline; it still ***poses*** a serious fire ***hazard.*** Follow all ***safety precautions*** that apply to gasoline.

2. Never ***attempt*** to remove an injection system component with the engine running. With 6000 to 8000 psi (42000 to 56000 kPa) fuel pressure, fuel could ***squirt out*** and ***puncture*** your skin. Blood poisoning or death could result.

3. Wear safety glasses when working around a diesel injection system. A leak could spray fuel into your eyes and cause ***blindness*** or death.

4. Never attempt to stop a diesel engine by covering the air inlet opening. Since there is no throttle valve, there is enough suction to cause hand ***injury*** or **to suck** ***rags*** and other objects into the engine ***intake manifold***.

Упражнение 12

Ответьте на вопросы по тексту

1. What does maintenance of a diesel injection system involve? 2. Why should you use the cardboard? 3. Where are the fuel filters normally located? 4. Is it important to keep filters clean? 5. What can the drain used for? 6. What can water mixed with a diesel oil cause? 7. Can you attempt to remove the injection system components with the engine running? 8. What can be the result of squirting out of fuel? 9. What should you double check? 10. When should you wear safety glasses? 11. What can fuel spraying into the eyes cause? 12. Can you attempt to stop a diesel engine by covering the air inlet opening? 13. Why can the rags or other objects be sucked into the engine intake manifold?

Упражнение 13

Переведите слова, данные в скобках, на английский язык.

1. (Техническое обслуживание) involves changing filters periodically, inspecting the system for signs of troubles. 2. Use a piece of (картон) to find the leak, when detecting signs of fuel leak. 3. (Замените) any injection line or return hose that is not in perfect condition. 4. The main fuel filter may have (спускное отверстие). 5. (Чтобы слить) trapped water the drain can be used. 6. Water mixed with diesel oil can cause (точечную коррозию) of injection system components. 7. Diesel fuel is not so (воспламеняющийся) as gasoline. 8. While working with fuel you should follow all (меры предосторожности). 9. A leak could spray fuel into your eyes and cause (слепоту). 10. Suction through the air inlet opening of a diesel engine can cause hand (травму).

ТЕКСТ 5

GASOLINE INJECTION PROBLEM DIAGNOSIS

troubleshooting skills – умения найти неисправности
service manual – инструкция по эксплуатации
to find out – обнаруживать
to visualize – отчетливо представлять
to relate – соотносить
source – источник
to inspect = to check – проверять
kinked lines – перекрученные шнуры
EFI – electrical fuel injection
to disconnect – отключать
terminals – клеммы
wiring harness – электропроводка
rust – ржавчина
corrosion – коррозия
resistance – сопротивление
frequent – частый
to damage – наносить вред

To diagnose problems in a gasoline injection system you must use:

1) Your knowledge of system operation;

2) Basic ***troubleshooting skills;***

3) ***A service manual.***

As you try ***to find out*** problems, ***visualize*** the operation of the four subsystems (air, fuel, sensor, control). ***Relate*** the function of each subsystem component to the problem. This will let you eliminate several possible problem ***sources*** and concentrate on others.

It is possible to compare a carburetor fuel system with gasoline injection system. Several parts in each system perform the same function.

Inspecting injection system. A general inspection of the engine and related components will sometimes locate gasoline injection troubles. ***Check*** the condition of wires and other parts. Look for fuel leaks, vacuum leaks, ***kinked*** **lines**, loose electrical connections and other troubles.

With an ***EFI system***, you may need ***to disconnect*** and check ***the terminals*** of ***the wiring harness***. Inspect them for ***rust***, ***corrosion*** or burning. High ***resistance*** at terminal connections is ***a frequent*** cause of problems.

CAUTION! Do not disconnect an EFI harness terminal with the ignition switch ON. This could ***damage*** the computer. Refer to a service manual for details. You may be told to disconnect the negative battery terminal during EFI service.

Упражнение 14

Ответьте на вопросы по тексту

1. What three things must be used when diagnosing problems in a gasoline injection system? 2. What should you do if you try to locate problems in a gasoline injection system? 3. Is there anything in common between a carburetor fuel system and a gasoline injection system? 4. What should you check while inspecting the engine and parts? 5. What may you need to do with an EFI system? 6. Why should you check the terminals? 7. What is a frequent cause of problems in terminals?

Упражнение 15

Переведите слова, данные в скобках, на английский язык

1. (Инструкция по эксплуатации) will help you to diagnose problems in gasoline injection system. 2. If you (соотнесите) the function of each subsystem component to the problem it will let you eliminate several (источников) of problems. 3. To locate general gasoline troubles (проверьте) condition of all hoses, wires and other parts. 4. While checking the engine, look for fuel leaks, vacuum leaks, and (перекрученные провода) loose electrical connections. 5. Disconnect the system and check (клеммы) of the wiring harness. 6. (Высокое сопротивление) at terminal connections is a frequent cause of problems. 7. While inspecting injection system, check terminals for (ржавчина) and corrosion. 8. To diagnose problems in a gasoline injection system you must use basic (умения найти неисправность).

UNIT III

GRAMMAR: CONTINUOS TENSES ACTIVE

PRESENT CONTINUOUS ACTIVE (now)

I am working	**I am not working**	**Am I working?**
You **are working**	you **are not working**	**Are** you **working**?
he she **is working** it	he she **is not working** it	he **Is** she **working?** it
we they **are working**	we they **are not working**	we **Are** they **working**?

PAST CONTINUOUS ACTIVE (at 5o'clock yesterday, when we came)

I, He, She **was working** It	I He, She **was not working** It	I **Was** he, she **working**? it
We You **were working** They	We You **were not working** They	we **Were** you **working**? they

FUTURE CONTINUOUS ACTIVE (at 5o'clock tomorrow, this time tomorrow)

I, we	I, we	I, we
He, She **will be working**	He, She **will not be working**	**Will** he she **be working**?
It	It	it
You, They	You, They	you, they

Упражнение 1

Раскройте скобки, употребив глаголы в одном из времен Continuous

1. He (to repair) his car, the whole day yesterday. 2. This time tomorrow, I (to pass) examination. 3. Look! He (to drive) too fast. 4. While I (to look for) leakage in the system my friend, (to inspect) the tires. 5. The mixture of air and fuel (to enter) the combustion chamber this time. 6. The burning fuel (to expend) and (to force) the piston down on the power stroke now. 7. What (to do) you at midday tomorrow? – This time I (to work in a garage). 8. At six o'clock we (to listen) to the lecture about gasoline injection. 9. Tomorrow from 3 to 5 the mechanic (to check) new auto service equipment

ТЕКСТ 1

COOLING SYSTEM

to force – нагнетать, форсировать
coolant – охлаждающая жидкость
fan – вентилятор
jacket – рубашка (охлаждения)
excess – излишек
to transfer – передавать
proper – нужный (должный)
liquid – жидкость
sheet metal – тонкий листовой металл
duct – канал
shroud – кожух
fin – ребро
to route – направлять
thermostatically controlled – контролируемый термостатом
flap – заслонка
solution – раствор
advantage – преимущество
exhaust emission – выделение с выхлопными газами

The basic parts of a cooling system are:

1. Water pump which ***forces coolant*** through engine and other system parts.
2. Radiator hoses to connect engine to radiator
3. Radiator which transfers engine coolant heat to outside air.
4. ***Fan*** which draws air through radiator.
5. Thermostat which controls coolant flow and engine operating temperature.

When the engine is running a fan belt powers the water pump. The water pump forces coolant to circulate through the engine water ***jackets.***

While the engine is cold, the thermostat remains closed. This prevents coolant from going to the radiator. Instead, it circulates around inside the engine. This helps warm the engine quickly.

When the engine reaches operating temperature, the thermostat opens. Heated coolant then flows through the radiator. ***Excess*** coolant heat ***is transferred*** to the air flowing trough the radiator. This maintains ***a proper*** engine temperature.

A cooling system has several functions. It must: 1) remove excess heat from the engine; 2) maintain a constant engine operating temperature; 3) increase the temperature of a cold engine as quickly as possible; 4) provide a means for heater operation (warming passenger compartment).

COOLING SYSTEM TYPES

There are two major types of automotive cooling systems: ***liquid*** and air. An air cooling system uses large cylinder cooling fins and outside air to remove excess heat from the engine. The cooling ***fins*** increase the surface area of the metal around the cylinder. This allows enough heat to transfer from the cylinder.

An air cooling system commonly uses plastic or ***sheet metal ducts*** and ***shrouds*** (enclosures) ***to route*** air over the cylinder fins. ***Thermostatically*** controlled ***flaps*** regulate airflow and engine operating temperature.

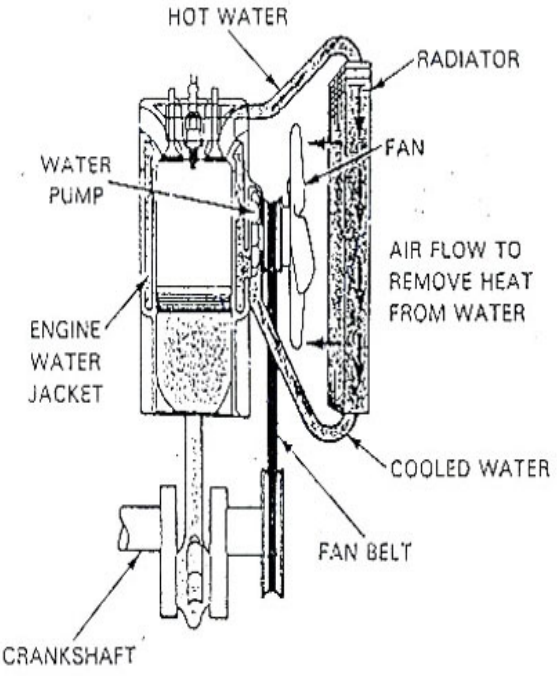

Рис. 4

Note! Air-cooled automotive engines have been replaced by liquid (water) cooled engines.

A liquid cooling system circulates ***solution*** of water and antifreeze through the water jackets. Then the coolant collects excess heat and carries it out of the engine.

A liquid cooling system has several ***advantages*** over an air type system:

1. More precise control of engine operating temperature.
2. Less temperature variation inside engine.
3. Reduced ***exhaust emissions*** because of better temperature control.
4. Improved heater operation to warm passengers.

Упражнение 2

Ответьте на вопросы по тексту

1. What are the basic parts of a cooling system? 2. What is used to force coolant through the engine and other parts? 3. How is the engine connected to the radiator? 4. What is the function of the radiator? 5. What is a fan used for? 6. What controls a coolant flow and engine operating temperature? 7. When does thermostat remain closed, and when open? 8. What are the functions of a cooling system? 9. What are the major types of a cooling system? 10. How is the surface area of metal around the cylinder increased? 11. What are the flaps used for in an air cooling system? 12. Which type of a cooling system is frequently used? 13. What are the advantages of a liquid cooling system?

Упражнение 3

Переведите слова данные в скобках на английский язык.

1. Water pump (форсирует) coolant through the engine. 2. (Вентилятор) draws air through the radiator. 3. Excess coolant heat (передается) to the air flowing through the radiator. 4. An air cooling system usually uses (провода тонкого листового металла). 5. (Ребра) increase the surface area of metal around the cylinder. 6. To regulate airflow and engine operating temperature the (контролируемые термостатом) flaps are used. 7. A liquid cooling system circulates (раствор) of water and antifreeze through the water jacket. 8. A liquid cooling system has several (преимуществ) over an air type system. 9. A liquid cooling system has reduced (выделение с выхлопными газами) because of better temperature control. 10 The coolant collects (излишек) heat and carries it out of the engine.

Упражнение 4

Постройте предложения, соединив их части, приведенные в колонках

1. Water jacket	a) increase the surface area of the cylinder
2. Flaps	b) draws air through the radiator
3. Water pump	c) transfers engine coolant heat to outside air
4. Radiator	d) controls coolant flow and engine operating temperature
5. Fins	e) regulate air flow and engine operating temperature
6. Radiator hoses	f) forces coolant through the engine and other parts
7. Fan	g) is internal passages in the engine
8. Thermostat	h) connect the engine to the radiator

ТЕКСТ 2

COOLING SYSTEM PROBLEM DIAGNOSIS

toward – к, по направлению к
to involve – включать в себя
to gather – собирать
loss – потеря
idling – холостой ход
puddle – лужа
wetness – мокрота, сырость
grinding – шлифовка, молотьба
hissing – свист, шипение
debris – осколки
bubbles – пузыри
blade – лопасть
to drop into – втянуться

The first step toward diagnosing and locating cooling system problems ***involves*** gathering information. Talk to the car owner or service writer to find out as much as possible about the symptoms of the problem. For example, you might ask these questions:

1. Can you describe the cooling system problem (engine temperature light on, overheating, and coolant ***loss***)?
2. When does the problem seem to occur (all the time, at highway speeds, when ***idling*** only)?
3. How long have you had the problem?
4. When was the first time the coolant was replaced (year, two years, never)?
5. Have you noticed any coolant leaks (***puddles*** on ground, ***wetness*** around engine) or have you added coolant?
6. Are there any unusual noises that might relate to the cooling system (***grinding*** at front of engine, ***hissing***)?

The answers to these kinds of questions will be very useful. It will help you eliminate the least likely sources so that you can concentrate on the most probable causes of the malfunction. After gathering information, verify the complaint. Test drive the car. Inspect the engine compartment. Listen to engine

noises. Do what is needed to make sure the symptoms have been properly described.

Inspecting cooling system. A visual inspection will frequently be enough to find the source of the cooling system problem. Look for obvious troubles:
1) Coolant leaks; 2) Loose or missing fan belts; 3) Low coolant level. 4) Abnormal water pump noise; 5) Leaves and ***debris*** covering outside of radiator; 6) Coolant in oil (oil looks milky); 7) Combustion leakage into coolant (air ***bubbles*** in coolant).

CAUTION! Keep your hands and tools away from a spinning engine fan. Wear eye protection and stand behind, not over, the spinning fan ***blade***. Then, if tools ***are dropped into*** a fan or a fan blade breaks off, you are not likely to be hit and injured by flying parts.

GRAMMAR: CONTINUOUS TENSES PASSIVE

to be + being + PARTICIPLE II

PRESENT CONTINUOUS PASSIVE

I **am being asked**	I **am not being asked**	**Am** I **being asked?**
He, She, It	He, She, It	**Is** he (she, it) being
is being asked	**is not being asked**	**asked**?
We, You, They	We, You, They	**Are** we (you, they)
are being asked	**are not being asked**	**being asked**?

PAST CONTINUOUS PASSIVE

I, He, she, it	I, he, she, it	**Was** I, he, she, it
was being asked	**was not being asked**	**being asked**?
We, you, they	We, you, they	**Were** we, you, they
were being asked	**were not being asked**	**being asked**?

Запомните: **FUTURE CONTINUOUS TENSES** – не существует

Упражнение 5

Переведите предложение на русский язык, обращая внимание на глаголы в Continuous Tenses Passive

1. The equipment was being tested in the laboratory the whole day yesterday. 2. The oil is being drawn from the sump. 3. My car is being repaired now in the garage. 4. Were you being asked about the symptoms of fuel system problems? 5. The new types of the engine was being discussed when I entered the room. 6. The operation of the fuel system was not being described properly by that student at the examination that time yesterday. 7. The very small particles are being removed from oil by oil filter. 8. The camshaft is being driven by the belt of the crankshaft. 9. While he was being asked the questions about accident, his car was being carefully inspected. 10. From 11 till 15 o'clock last Tuesday the main components of lubrication system were being considered.

ТЕКСТ 3

LUBRICATION SYSTEM

service life – срок службы
rapidly – быстро
to overheat – перегревать
to score – царапать
bearing – подшипник
lubricant – смазка
oil pan – поддон
oil pump – масляный насос
to strain out – фильтровать, задерживать
impurities – примеси
oil gallery – масляная магистраль
pickup tube – маслосборник
particle – частица
rocker arm – коромысло
connecting rod – шатун
to spray – распылять
wrist pins – поршневые пальцы
to drain – стекать
wear – износ
contaminant – загрязнитель
to absorb – поглощать
shock – удар

to pull out – вытягивать, качать

screen – фильтр

property – свойство

to accomplish –совершать

The lubrication system is important to engine ***service life*** because it forces oil to high friction points in the engine. Without a lubrication system, friction between parts would destroy an engine very quickly. Many of the engine parts would ***rapidly overheat*** and ***score*** from this friction. Engine ***bearings***, piston rings, cylinder walls, and other components could be ruined.

A *lubrication system* consists of:

1. ***Motor oil*** (***lubricant*** of moving parts in engine). (рис.5)
2. ***Oil pan*** (reservoir or storage area for motor oil).
3. ***Oil pump*** (forces oil throughout inside of engine).
4. ***Oil filter*** (***strains out impurities*** in oil).
5. ***Oil galleries*** (oil passages through engine)

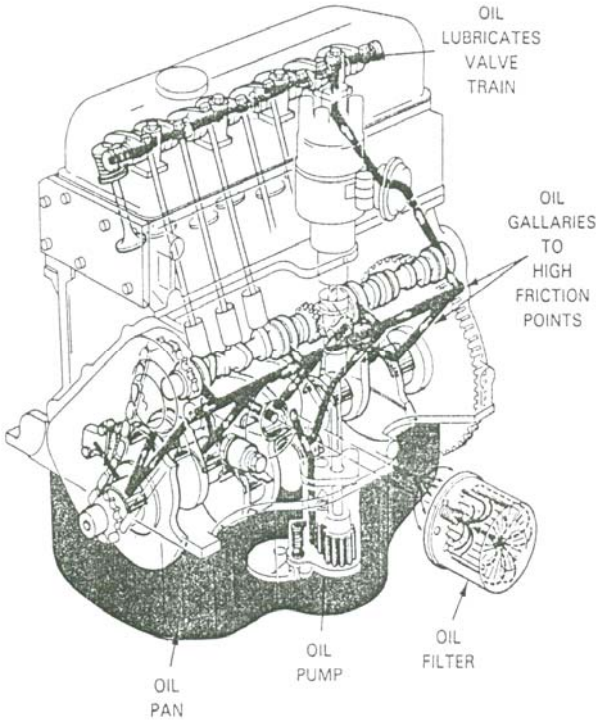

Рис. 5

Lubrication system operation. With the engine running, the oil pump ***pulls*** motor oil ***out*** of the oil pan.

A ***screen*** on ***the pickup tube*** removes large ***particles*** from the oil before oil enters the pump. The pump then pushes the oil through the oil filter and oil galleries. The oil filter cleans the oil, removing very small particles. The filtered oil then flows to the camshaft, crankshaft, lifters, ***rocker arms***, and other moving parts. When oil leaks out of the engine bearings, it sprays on the outside of internal engine part. For example, when oil leaks out of the ***connecting rod*** bearings ***sprays*** on the cylinder walls. This lubricates the piston rings, pistons,

wrist pins, and cylinders. Oil finally ***drains*** back into the oil pan for recirculation.

An engine lubrication system has several important functions. It: 1) reduces friction and ***wear*** between moving parts, 2) helps transfer heat and cool engine parts, 3) cleans the inside of the engine by removing ***contaminants*** (metal, dirt, plastic, rubber, and other particles), 4) cuts power loss and increases fuel economy, 5) ***absorbs shocks*** between moving parts to quiet engine operation and increase engine life.

The properties of engine oil and the design of modern automotive engines allow the lubrication system ***to accomplish*** these functions.

Упражнение 6

Ответьте на вопросы по тексту

1. Is the lubrication system important to engine service life? Why? 2. What are the basic parts of a lubrication system? 3. What is motor oil? 4. What is oil pan? 5. What is the function of the oil pump? 6. What is used to strain out impurities in oil? 7. What are the oil galleries? 8. What particles does a screen on the pickup tube remove? 9. What parts, considered to be moving, need to be lubricated? 10. What are the functions of a lubrication system? 11. What allows the lubrication system to accomplish its functions?

Упражнение 7

Переведите слова, данные в скобках на английский язык

1. The lubrication system is important for engine (срока службы). 2. Many of engine parts may (быстро) overheat and score from this friction. 3. Because of overheating many piston rings, cylinder walls, engine (подшипники) are ruined. 4. (Поддон) is a reservoir or storage area for motor oil. 5. The oil filter (фильтрует) impurities in oil. 6. The oil pump (качает) motor oil out of the oil

pan, when the engine is running. 7. (Сито на маслосъемнике) removes large particles from the oil before the oil enters the pump. 8. When oil leaks out of (подшипников шатуна) if sprays on the cylinder walls. 9. Lubrication system reduces friction and (износ) between moving parts. 10. Lubrication system (поглощает) shocks between moving parts to quiet engine operation.

Упражнение 8

Подберите определения к следующим терминам: friction, oil gallery, oil filter, rocker arm, lubricant, overheat, oil pan, particle, oil pump, screen.

1. An arm that rocks on a shaft or pivots on a bolt or stud. 2. A wire-mesh filter placed at the inlet end of the oil pump pick up tube prevents dirt from entering the oil pump. 3. The detachable cover bolted to the cylinder block which encloses the crankcase and acts as an oil reservoir. 4. A filter which removes impurities from the engine oil passing through it. 5. A small hole or gallery in an assembly or casting through which oil flows. 6. A very small piece of metal, dirt or other impurity which may be contained in lubricant. 7. Any material, usually a petroleum product such as grease or oil, which is placed between two moving parts to reduce friction. 8. The device that delivers oil from the reservoir to the moving parts. 9. To heat excessively; also to become excessively hot. 10. The resistance to motion between bodies in contact with each other.

Упражнение 9

Поставьте глаголы в скобках в одном из времен Continuous или Indefinite.

1. Yesterday I (to buy) some magazines about automobile technology. 2. I saw him yesterday he (to drive) a new car. 3. Usually she (not to park) her car near the shop. 4. Now my father (to work) in a garage. 5. The mechanic (to clean) the parts of the engine this time tomorrow.6. They (to come) in time, they took a taxi. 7. I (not to want) to inspect your car now. 8. Our drive examination (to

be) next Monday. 9. Look! He (to learn) traffic rules to the future exam. 10. Sometimes we (to take) a bus to get to the University. 11. While he (to look through) morning newspapers, his mother (to pack) his things. 12. He (to use) service manual to determine reasons of trouble.

GRAMMAR: **PERFECT TENSES ACTIVE** to have + **PARTICIPLE II**

PRESENT PERFECT (just, already, never, ever, since)

I, you, we, they **have translated** He, she, it **has translated**	I, you, we, they **have not translated** He, she, it **has not translated**	**Have** I, you, we, they **translated**? **Has** he, she, it translated?

PAST PERFECT (by that time yesterday, before I called him)

I, he, she, it we, you, they **had translated**	I, he, she, it we, you, they **had not translated**	**Had** I, he, she, it we, you, they **translated?**

FUTURE PERFECT (by 5 o'clock tomorrow, when I call him)

I, he, she, it we, you, they **will have translated**	I, he, she, it we, you, they **will not have translated**	**Will** I, he, she, it we, you, they **have translated?**

Упражнение 10

Раскройте скобки, употребив одну из форм Perfect Tense

1. They (to find) problems in a lubrication system. 2. He (to inspect) the engine, before he found a defective indicator. 3. We (to check) for oil leakage, wire, smashed oil pan or other trouble by this time tomorrow. 4. Friction between parts almost (to destroy) an engine without lubrication. 5. They already (to learn) all the safety rules. 6. We (to study) all the properties of that material. Now we can use it in our experiment. 7. He (to compete) this work by the end of this week. 8. The engineers (to improve) some engine parts, then they fitted them in to new engine. 9. I just (to study) all the conditions influencing the

performance of the engine. 10. Tomorrow when I come to the laboratory he (to make) already their experiment.

ТЕКСТ 4

GENERAL SAFETY RULES

storage area – склад
shop – мастерская
creeper – тележка для работника под автомобилем
cklacene – ожерелье
jewelry – драгоценности
to tear off – отрывать
flesh – плоть
chunk – кусок
to roll up – сворачивать
sleeve – рукав
to secure – защищать
tool – инструмент
sharp – острый
to puncture – прокалывать
grinding – шлифовка
welding – сварка
"best tool" – наилучший инструмент
knees – колени
safety guard – защитное устройство
shield – кожух
to keep ones back straight – держать спину прямо
precision – точность
fumes – запахи
to dust – пыль stir up – взбалтывать, размешивать
to jack up – поднимать домкратом
cancer-causing agent – химическое вещество, вызывающее рак
unless – пока не
jack stand – стойка домкрата
condition – состояние
spinning knife – вращающийся нож
to inflict – причинять
injury – рана
to fly out – вылетать
park – место
cleaning solvents – чистящий растворитель
to be exposed – быть подверженным
to obtain – получать
permission – разрешение
unfamiliar – незнакомый

Listed are several ***general safety rules*** that should be remembered and followed at all times:

1. WEAR EYE PROTECTION during any operation that could endanger your eyes. This would include operating power tools, working around a running car engine, carrying batteries, and so on.

2. "CLOWN CAN KILL!" In other words, avoid anyone who does not take shop work seriously. Remember, a joke is "***an accident just waiting to happen***."

3. KEEP YOUR SHOP ORGANIZED. Return all tools and equipment to their proper ***storage areas***. Never lay tools, ***creepers***, or parts on the floor.

4. DRESS LIKE A MECHANIC, not like "Mr. or Ms. Hollywood!" Remove rings, bracelets, ***necklaces,*** watches, and other ***jewelry.*** They can get caught in engine fans, belts, drive shafts – ***tearing off flesh***, fingers, ***chunks*** of hair, and ears. Also, ***roll up*** long sleeves and ***secure*** long hair; they too can get caught in spinning parts.

5. NEVER CARRY SHARP TOOLS or parts in your pockets. They can ***puncture*** the skin.

6. WEAR FULL FACE PROTECTION when **grinding**, ***welding***, and during other operations where severe hazards are present.

7. WORK LIKE A PROFESSIONAL, not like a "***crazy monkey***." When learning auto mechanics, it is easy to get excited about your work. However avoid working too fast. You could overlook repair procedure or safety rule.

8. USE THE RIGHT TOOL FOR THE JOB! There is usually a "best tool" for each repair task. Always be thinking about whether a different tool will work better than another, especially when you run into difficulty.

9. KEEP GUARDS OR SHIELDS IN PLACE. If a power tool has ***a safety guard***, use it.

10. LIFT WITH YOUR LEGS, not your back. There are many assemblies that are very heavy. When lifting, bend your ***knees*** while ***keeping your back straight***. On extremely heavy assemblies (transmissions, engine blocks, rear axles, transaxles) use a portable crane.

11. USE ADEQUATE LIGHTING. A portable shop light not only increases working safety, it increases working speed and ***precision.***

12. VENTILATE WHEN NEEDED. Turn on the shop ventilation fan anytime ***fumes*** are present in the shop.

13. NEVER STIR UP ASBESTOS DUST! Asbestos dusts (particles found in brake and clutch assemblies) are powerful CANCER-CAUSING AGENTS. Do NOT use compressed air to blow the dust off these parts.

14. JACK UP A CAR SLOWLY AND SAFELY. A car can weigh between one and two tons. Never work under a car ***unless*** it is supported by ***jack stands***. It is NOT safe to work under a car held only by a floor jack. .

15. DRIVE SLOWLY WHEN IN THE SHOP AREA with all of the other students and cars in the shop. It is very easy to have an accident.

16. REPORT UNSAFE CONDITIONS TO YOUR INSTRUCTOR. If you notice any type of hazard, let your instructor know about it.

17. STAY AWAY FROM ENGINE FANS! The fan on a car engine is like a SPINNING KNIFE. It can ***inflict*** serious injuries. Also, if part or tool is dropped into the fan, it can ***fly out*** and hit someone.

18. RESPECT RUNNING ENGINES. When a car engine is running, make sure that the transmission is in ***park,*** emergency brake is set, and wheels are blocked.

19. NO SMOKING! No one should smoke in an auto shop. Smoking is a serious fire hazard, considering fuel lines, ***cleaning solvents***, paints, and other flammables may ***be exposed.***

20. OBTAIN INSTRUCTOR PERMISSION before using any new or ***unfamiliar*** power tool, lift, or other shop equipment. Your instructor will need to give a demonstration.

Упражнение 11

Ответьте на вопросы по тексту

1. Should you wear special clothes in a shop area? 2. What things shouldn't you wear? Why? 3. Should you protect your eyes? 4. What does the phrase "an accident just waiting to happen" mean? 5. How should you lift heavy things? 6. What can asbestos dust cause? 7. Is a floor jack reliable to work under the car? 8. Why should you drive slowly in the shop area? 9. What must you do if you notice any type of hazard in the shop? Why?

Упражнение 12

Поставьте глаголы, данные в скобках, в нужном времени Indefinite, Continuous или Perfect

1. Every weekend he (to drive) to his country house. 2. Yesterday all the day we (to work) in the garage. 3. They just (to check) all the systems of the engine. 4. My friend (to get) into accident and (to damage) his car badly. 5. Every mechanic (to know) the main parts of the engine. 6. She (to drive) too fast and she didn't notice me. 7. I (to buy) all the parts needed in the shop next week. 8. By this time tomorrow I (to prepared) all the documents to your car. 9. While I (to fill) the fuel tank she (to try) to switch on the radio. 10. The engineer (to work) at a motor plant ten years ago. 11. We (not to design) the perfect device yet for checking the damages quickly. 12. Mass production of passenger cars (to increase) since 1980. 13. My sister never (to drive) the car before. 14. If you smoke in a shop area, it (to cause) serious fire hazard. 15. While we (to look for) troubles in the car, my sister (to gather) the flowers in the field. 16. In the center of the city we (to find) all the equipment we need.

GRAMMAR: PERFECT TENSES PASSIVE

to have + been + Participle II

PRESENT PERFECT

I, we **have been** You **asked** They He She **has been** It **asked**	I, we **have not been** You **asked** They He She **has not been** It **asked**	I, we **been** **Have** you **asked**? they he **Has** she **been** it **asked?**

PAST PERFECT

I, we You They **had** He **been** She **asked** It	I, we You They **had not** He **been** She **asked** It	I, we you **Had** they **been** he **asked?** she it

FUTURE PERFECT

I, we You **will have** They **been asked** He, She, It	I, we You **will not have** They **been asked** He, She, It	I, we you **have** **Will** they **been** he, she, it **asked?**

Упражнение 13

Переведите предложение на русский язык, обращая внимание на глаголы в Perfect Tenses Passive

1. Do what is needed to make sure the symptoms have been property described. 2. Coolant leak have been noticed during inspecting the system. 3. The pressure has been used to move the parts of the engine and produce power. 4. A crude two-stroke cycle internal-combustion engine that was fueled by coal gas had been developed by Etienne Lenoir. 5. Always double check that all fittings have been torqued before starting the engine. 6. The water pump had been powered from a fan belt when the engine was running. 7. As some unusual noises have been heard, they might relate to the cooling system. 8. The instructor's permission will have been obtained by six o'clock in the evening, so we will be able to use new shop equipment. 9. A portable crane has been used to lift engine

blocks and rear axles. 10. All tools and equipment will have been returned to their proper storage areas by this time.

UNIT IV

GRAMMAR: **MODAL VERBS**

Modal Verbs	Equivalents	ПЕРЕВОД
can (could)	to be able to	могу, умею
may (might)	to be allowed to	можно, разрешено
must	to have to	должен
should	ought to	следует, должен
need not		нет необходимости
to be to		должен по плану

Упражнение 1

Переведите предложения, обращая внимание на модальные глаголы и их эквиваленты

1. Internal combustion engines may be water cooled or air cooled. 2. The walls of the combustion chamber ought to be as smooth as possible. 3. The pistons must be strong, they must be as light as possible and they must function properly. 4. This car is not able to travel over fields and bad roads. 5. In this case you must stop the engine. 6. This equipment is allowed to be used for many purposes. 7. The mechanic should check the oil level in the engine. 8. In this car you may use all modern conveniences. 9. We have no time and we have to complete the inspecting of the system next time. 10. You needn't change the piston rings; the old ones are rather good. 11. The experiment was to be done in time.

ТЕКСТ 1

ELECTRICAL EQUIPMENT

to ignite – воспламенять
voltage – напряжение
electric arc – электродуга
to jump – проскакивать
ignition key – ключ зажигания
to turn off – выключать
motor gear – шестерня
to engage – зацепляться

tip – наконечник
to switch on – включать
distributor – распределитель
tiny – крошечный
amplifier – усилитель
circuit – цепь
current – ток
ignition coil – катушка зажигания
to spin – вращать
to be shut off – быть отключенным
charging system – система подзарядки
to replace – заменять
to reenergize – перезаряжать
alternator pulley – блок генератора
fan belt – ремень вентилятора
alternator – генератор переменного тока

The car's *electrical system* consists of several subsystems: ignition system, starting system, charging system, lighting system, and other systems.

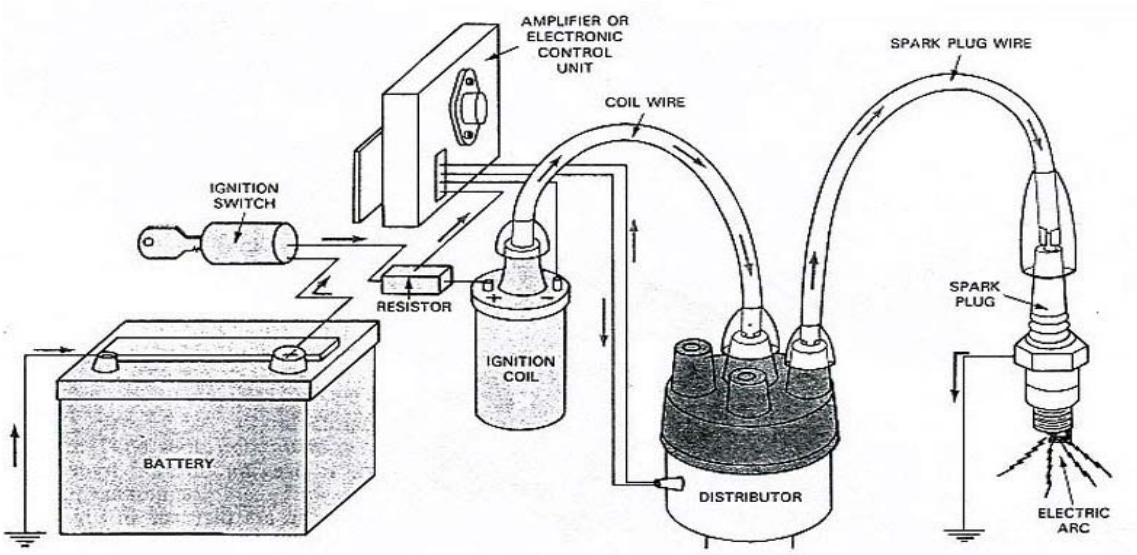

Рис. 6

An ***ignition system*** (Рис. 6) is needed on gasoline engines to ignite the air-fuel mixture. It produces extremely high ***voltage*** that operates the spark plugs. This causes the engine's air-fuel mixture to burn and produce power. A very hot ***electric arc jumps*** across ***the tip*** of the spark plug at the correct times. With the ignition ***switched ON*** and the engine running, ***the distributor*** produces ***tiny*** electrical signals for ***the amplifier*** or electronic control unit (electronic ***circuit***). One signal is produced for each power stroke. The electronic control unit increases these pulses into on/off current signals for the ignition coil.

By turning the coil current on and off, the coil can produce a high voltage output to "fire" the spark plugs. When the ***ignition key*** is turned off, the coil stops functioning and the engine stops running.

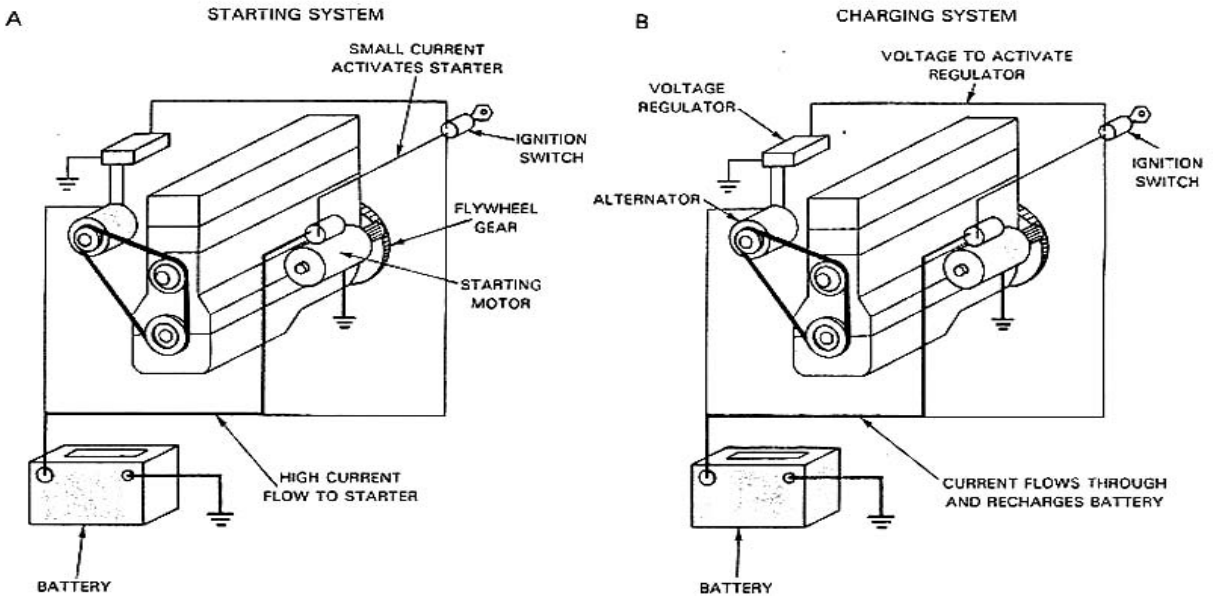

Рис. 7

The ***starting system*** (A) (рис. 7) has an electric motor that rotates the engine crankshaft until the engine starts and runs on its own power.

The battery provides the electricity for the starting system. When the key is turned to start, current flows to the parts of the starting system. The electric starting motor gear engages a gear on the engine flywheel. This ***spins*** the crankshaft. As soon as the engine starts, the starting system is ***shut off***.

The ***charging system*** (B) (рис.7) is needed ***to replace*** electrical energy drawn from the battery during starting system operation. ***To reenergize*** the battery, the charging system forces electric current back into the battery.

When the engine is running, the fan belt spins the ***alternator pulley***. The alternator (generator) can then produce electricity for the battery and other electrical needs of the car. A voltage regulator is used to control the output of the alternator.

Упражнение 2

Ответьте на вопросы по тексту

1. What does the car's electrical system consist of? 2. What is an ignition system needed for? 3. What causes the engine's air-fuel mixture to burn? 4. When does the distributor produce electrical signals for the amplifier? 5. What is the function of an electronic control unit? 6. When can the coil produce a high voltage output to "fire" the spark plugs? 7. What happens if the ignition key is turned off? 8. What rotates the engine crankshaft in the starting system? 9. What is the battery used for? 10. What is the function of the electric starting motor? 11. When is the starting system shut off? 12. What is the charging system needed for? 13. How does the reenergizing of the battery occur? 14. What spins the alternator pulley? 15. What is the alternator used for? 16. What is a voltage regulator used for?

Упражнение 3

Переведите слова, данные в скобках, на английский язык

1. The electrical system of the car consists of the ignition system, (зарядной системы), the starting system and others. 2. The ignition system is needed on gasoline engines to ignite mixture and produce high (напряжение). 3. The high voltage is needed to "fire" the spark plug. 4. With the ignition switched on and the running engine (распределитель) produces tiny electrical signals for the amplifier. 5. (Ток) flows to the parts of the starting system when the key is turned to start. 6. The electronic control unit amplifies pulses into on current signals for (катушки зажигания). 7. The electric starting motor gear (включает) a gear on the engine flywheel. 8. When the engine is running, he fan belt (вращает) the alternator pulley. 9. The charging system forces electric current back into the battery (чтобы перезарядить) the battery.

10. The charging system is needed (чтобы заменить) electrical energy drawn from the battery.

Упражнение 4

Подберите определения к следующим терминам: alternator, battery, circuit, energy, electric current, gear, ignition coil, ignition distributor, pulley, spark plug, starting motor, voltage, voltage regulator.

1. The complete path of an electric current, including the current source. 2. The capacity or ability to do work, usually measured in work units of pound-feet (kilogram-meters). 3. Mechanical device to transmit power, or turning of fort, from one shaft to another, contain teeth that interlace as mechanism turns. 4. A metal wheel with a V-shaped grooves around the rim; drives or is driven by a belt. 5. A movement of electrons through a conductor such as cooper wire; measured in amperes. 6. The transformer in the ignition system that increases the battery voltage to many thousand volts. 7. The assembly which includes a pair of electrodes and an insulator, that provides a spark gap in the engine cylinder. 8. The force which causes electrons to flow in a conductor; the difference in electrical pressure between two points in a circuit. 9. A device in the electric system that converts mechanical energy into electric energy for charging the battery. 10. The electric motor on the engine that turns the crankshaft for starting. 11. An electrochemical device, for storing energy in chemical form so that it can be released as electricity. 12. That part of the ignition system which closes and opens the circuit to the ignition coil with correct timing and distributes to the proper spark plugs the resulting high – voltage surges from the ignition coil. 13. A regulating device that prevents excessive alternator or generator voltage by repeatedly inserting a resistance into the field circuit.

ТЕКСТ 2

IGNITION SYSTEM PROBLEM DIAGNOSIS

challenging – сложный, трудный
to affect – влиять на
inoperative – недействующий
engine miss – перебои в работе двигателя
fouled – засоренный
preliminary – предварительный
wire – провод
deteriorated – изношенный
to upset – расстраивать
similar – схожий
contact point ignition system – контактная система зажигания
complexity – сложность
puffing noise – пыхтящий шум
self – diagnosis mode – вид самодиагностики
firing cylinder – обожженный цилиндр
rpm (revolutions per minute) – число оборотов в минуту
to evaluate – оценивать
to narrow down – сузить
common sense – здравый смысл
to glow – светиться
dash – щиток
to exist – существовать
to compare – сравнивать
to pinpoint – точно определить
to short – коротить

Ignition system problem diagnosis can be very ***challenging***. The ignition system and several other systems (fuel, emission, electrical systems) all work together. A problem in one system may ***affect*** the operation of other system.

For example, an ***inoperative*** gasoline injector can cause an ***engine miss*** or rough idle. An oil ***fouled*** spark plug will also cause ***an engine miss***. The symptoms for each will be almost identical. Only proper testing methods will find the faulty component.

Preliminary checks of ignition system. Visually inspect the condition of the ignition system with and without the engine running. Look for obvious problems: loose primary connections, spark plug ***wire*** pulled off, ***deteriorated*** secondary wire insulation, cracked distributor cap, or other trouble. At the same time, look over other engine systems. Try to find anything that could ***upset*** engine operation.

Check for dead cylinder. A dead cylinder is a cylinder that is NOT burning fuel on the power stroke. There may be ignition system troubles or problems in the engine, fuel system, or another system. A very rough idle and a ***puffing noise*** in the engine exhaust may indicate a dead cylinder.

To check for a dead cylinder, pull off one spark plug wire at a time. On a "live" or **firing cylinder**, pulling the wire off will cause engine ***rpm*** to drop and idle to become rougher.

If idle smoothness and rpm do not change with the plug wire off, that cylinder is DEAD. It is not producing power. You need to check for spark at the wire, spark plug condition, and, possibly low cylinder compression.

After checking the system, you must ***evaluate*** the symptoms and narrow down the possible causes. Use your knowledge of system operation, a service manual troubleshooting chart, basic testing methods, and common sense to locate the trouble.

COMPUTERIZED IGNITION SYSTEM SERVICE

Many of the components of a computer controlled ignition system are ***similar*** to those of electronic or ***contact point ignition systems***. This makes testing about the same for many parts (spark plugs, secondary wires, ignition coil). However, the computerized ignition has engine sensors and a computer which add to the ***complexity*** of the system.

Computer self-diagnosis mode. Some computerized systems have a check engine light in the ***dash*** that ***glows*** when a problem ***exists***. The computer can be activated to produce a number code. The code can ***be compared*** to information in the car's service manual ***to pinpoint*** the source of a problem. This makes testing and repairing a computerized system much easier.

WARNING! A computerized ignition system can be seriously damaged if the wrong wire ***is shorted*** to ground or if a meter is connected improperly. Always follow manufacturer's testing procedures.

Упражнение 5

Ответьте на вопросы по тексту

1. What systems does the ignition system work together with? 2. What can cause an engine miss or rough idle? 3. What problems should you look for while visually inspecting the system? 4. What is a dead cylinder? 5. What troubles may indicate a dead cylinder? 6. What should you do to check for a dead cylinder? 7. What should you do after checking the system? 8. What is the difference between a computer controlled ignition system and a contact point ignition system? 9. What is a check engine light in the dash used for? 10. Can a computerized ignition system be damaged if the wrong wire is shorted?

GRAMMAR: **INFINITIVE FORMS**

	Active	Passive
Indefinite	**to write**	**to be written**
Continuous	**to be writing**	------
Perfect	**to have written**	**to have been written**

Упражнение 6

Переведите предложения на русский язык, обращая внимание на инфинитив.

1. It is difficult to drive a car in big cities. 2. We must study safety rules to drive in traffic. 3. Now he must be passing his exam on driving. 4. All the systems should have been checked in time. 5. To develop new equipment for car servicing is our task. 6. The problem to be discussed at the international conference is connected with a new design of a motor vehicle. 7. To minimize friction between surfaces the lubricating oil is used. 8. Etienne Lenoir was the first to invent the first internal combustion engine. 9. I was sure to have

inspected the engine carefully. 10. To reduce speed or to stop the car the brake system produces friction.

Упражнение 7

Переведите слова, данные в скобках, на английский язык, обращая внимание на функции инфинитива

1. In the automobiles a problem in one system may (влиять на) the operation of the other systems. 2. While looking over the engine system you should try (найти) anything that could upset engine operation. 3. At first you should check the ignition system then (оценить) the symptoms and (сузить) the possible causes. 4. The loose primary connections, deteriorated secondary wire insulation, cracked distributor cap can (расстроить) operation of the engine. 5. The oil spark plug (которая засорена) may cause an engine miss. 6. The computer self-testing code is compared to information in the car's service manual (чтобы точно определить) the source of the problem.

ТЕКСТ 3

SERVICING CHARGING SYSTEM

to run – работать to crank – заводить двигатель to furnish – снабжать critical – нормируемый a/c (alternating current) – переменный ток d/c (direct current) – постоянный ток tension – напряжение backward – наоборот reversed polarity – обратная полярность	fusible link – плавкий предохранитель ground strap – плоский провод для соединения booster battery – добавочная батарея ruinously –губительно to be tight – быть сжатым lead – проводник terminal – клемма to guard – защищать, предохранять to permit – позволять

The automobile needs electricity ***to run***. The starter motor needs electricity ***to crank*** the engine for starting. The ignition system needs electricity to produce the spark that ignites the air-fuel mixture in the engine cylinders and keeps the engine running. The indicators and other electric devices also need electricity. There are two sources of electricity in the car, the battery and the charging system. The battery can ***furnish*** only a limited amount of electricity. After that, it is run down, or discharged. It needs recharging before it can supply additional electricity. However, the charging system can furnish electricity all the time the engine running.

There are a number of things to remember when servicing ***a/c*** charging system. The electrical technician should know these points:

1. Belt tension is more ***critical*** on alternators than on ***d/c*** generators because of greater inertia of the heavier rotor in the alternator. Check belt ***tension*** periodically.
2. Never install a battery ***backward***. ***The reversed polarity*** can damage the alternator because a heavy current will flow through the diodes as soon as the battery is connected. This will burn out the diodes if ***the fusible link*** in the line does not burn out first. It will also burn out electronic ignition system (if fusible link does not burn out first).
3. When charging a battery in the car, be sure to disconnect the battery ***ground strap*** from the grounded battery terminal. This protects the alternator diodes and the transistors (in transistor type regulators) from the high charging voltage. The transistors in electronic ignition systems could also be damaged by the high charging voltage.
4. Be sure to connect the battery charger with the correct polarity to the battery. It is actually possible to reverse battery polarity by charging it backward. If this happens, then, when the battery ground strap is reconnected, the reversed

polarity can ruin the alternator and alternator diodes, as mentioned in item 2 above.

5. If they have to use ***a booster battery*** to jump-start the engine, be sure to follow the instructions. Failure to follow the instructions can cause serious damage to equipment and possible personal injury.

6. Never operate the alternator on open circuit that is not connected to a battery. This will allow a ***ruinously*** high voltage to build up in the alternator. Make sure all connections in the system ***are tight*** before starting the engine.

7. Never short between or ground any of the terminals in the charging system. This could ruin diodes or transistors.

8. Never disconnect ***leads*** from the alternator or regulator without first disconnecting the ground strap from the battery's ground ***terminal***. This ***guards*** against accidental grounds or which could permit a high current to flow. This would probably ruin the alternator or other parts.

Упражнение 8

Переведите слова, данные в скобках, на английский язык

1. You should check belt (напряжение) periodically. 2. There is a number of things to remember when servicing (переменный ток) charging system. 3. Because a heavy current will flow through the diodes as soon as the battery is connected, the (обратная полярность) can damage the alternator. 4. The transistors in electronic systems could also be (поврежденными) by the high charging voltage. 5. It is actually possible to reverse battery polarity by charging it (наоборот). 6. Be sure to follow the instructions, if you have to use (добавочная батарея) to jump-start the engine. 7. Never operate the alternator on (открытой цепи), that is not connected to a battery. 8. Make sure all connections in the system (сжаты) before starting the engine. 9. You must not disconnect leads from the alternator or regulator without disconnecting

(плоские проводы для соединения) from the battery's ground terminal. 10. Never disconnect (проводники) from alternator without first disconnecting the ground strap from battery's ground terminals. 11. The battery can (снабжать) only a limited amount of electricity. 12. The starter motor needs electricity (чтобы заводить) the engine for starting. 13. The automobile needs electricity (для работы).

Упражнение 9

Переведите предложения, укажите предложения с инфинитивом

1. The ignition system needs electricity to produce the sparks and keep the engine running. 2. The charging system can furnish electricity all the time the engine running. 3. The symptoms must have been evaluated after checking the system. 4. The answer to these questions will help you in eliminating sources of coolant leakage. 5. The permission for using new equipment must be given by the instructor. 6. You should be able to arrive at a logical deduction about the cause of the problem. 7. While inspecting the engine compartment, listen to engine noises. 8. You should wear safety glasses when working on a diesel injection system. 9. Excess coolant heat is transferred to the air flowing through the radiator. 10. When you doubt, refer to a service manual for the make of vehicle being serviced. 11. To control engine speed and power output the throttle can be open or closed. 12. The crankshaft makes two revolutions to complete the four-stroke cycle.

Упражнение 10

Переведите предложения, обращая внимание на Complex Object

Существительное / местоимение в объектном падеже + INFINITIVE

I want MY FRIEND/ HIM TO HELP me with mathematics

1. We know the internal combustion engine to be the most convenient source of power for driving a motor vehicle. 2. We know the battery to be one of the sources of electricity in the car. 3. I asked my friend to check the lubrication system of my car. 4. He saw the mechanic remove the old cylinders with great skill. 5. We know the transistors in electronic ignition systems to be damaged by the high charging voltage. 6. Every mechanic knows the camshaft to control the opening of the valves. 7. The engineers considered the new type of the engine to work more efficiently. 8. The driver of that car wished the old engine to be replaced by the new one. 9. The brakes enable the driver to stop or slow the car. 10. The clearance between the cylinder walls and the piston let the piston move freely up and down in the cylinder.11. They expected the new device to find wide application.

Упражнение 11

Переведите предложения, обращая внимание на Complex Subject

Существительное/местоимение + INFINITIVE

ENGINEER / HE is known TO WORK at this problem.

Известно, что инженер/он работает над этой проблемой

1. All aluminum alloys are known to have good bearing properties. 2. Noise level is considered to be a drawback with air-cooled engines. 3. The electricity is known to be needed for the automobile operation. 4. The origin of the automobile is said to be traced (to trace – проследить) to Europe. 5. The spark is said to ignite the air-fuel mixture in the engine cylinders. 6. Americans were said to have a love affair with the automobile, and USA became a nation on wheels. 7. The body is likely to be one of the most basic parts of automobile. 8. The engine is known to be located in the front of the chassis 9. The battery is considered to furnish only a limited amount of electricity. 10. The camshaft is sure to be driven by the belt from the crankshaft. 11. The spark plug is

considered to be one of the main parts of the ignition system. 12. The Otto engine proved to be more effective than Lenoir's engine. 13. He is sure to connect the battery charger with correct polarity. 14. The students are likely to finish the testing of this engine next week. 15. I am likely to follow the instructions, if I have to use a booster battery to jump start the engine.

UNIT V

ТЕКСТ 1

STEERING SYSTEM

handling – управление
linkage steering – рулевой привод
worm gear – червячная шестерня
управление
rack and pinion steering – рулевой
механизм с рейкой и шестерней
power assist – усилитель руля
wheel steering knuckle – поворотный
кулак
steering shaft – вал рулевого
механизма
ball socket – шаровой шарнир (сухарь)
parking brake – стояночный тормоз
to unscrew – вывинчивать
cap – крышка
dipstick – щуп
to wipe off – вытирать
marking – маркировка
to reinstall – переустанавливать
stick – стержень
to overfill – переполнять
steering hoses – шланги управления
road feel – способность
чувствовать дорогу
bump – ухаб, бугор
steering gear – шестерня рулевого
механизма
steering wheel – руль
steering column – рулевая колонка
tubing wrench – гаечный ключ для
труб
cross threading – переплетение
to slip – скользить
squeal – скрип
to snap – зажимать
erratic – неустойчивый
to pry on – действовать при
помощи рычага
dent – выбоина, вмятина
reinforced flange – укрепленный
фланец (выступ)
to loosen – ослаблять
bracket – кронштейн
inward – внутрь

to rupture – разрываться
flare nut – конусная гайка
specs.(specifications) – технические характеристики

The steering mechanism works with the suspension system to provide a safe ***handling*** car. There are two basic kinds of steering system in use today: ***linkage (worm gear) steering and rack and pinion steering***. They may be operated manually or with ***power assist***.

The steering system must perform several important functions:

1. Provide precise control of front wheel direction.
2. Maintain correct amount of effort needed to turn the front wheels.
3. Transmit ***road feel*** (slight steering wheel pull (тяга руля) caused by road surface) to the driver's hands.
4. Absorb most of the shock going to ***the steering wheel*** as the tires hit ***bumps*** and holes in road.

The steering system is composed of two elements: ***a steering gear*** at the lower end of ***the steering column*** end, linkage between the gear and ***the wheel steering knuckle.*** A linkage steering system consists of the following parts:

1. Steering wheel (used by driver to rotate steering shaft that passes through steering column).
2. Steering shaft (transfers turning motion from steering wheel to steering gearbox).
3. Steering column (supports steering wheel and steering shaft).
4. Steering gearbox (changes turning motion into straight line motion to the left or right).
5. Steering linkage (connects steering gearbox to steering knuckles and wheels).

STEERING SYSTEM MAINTENANCE

Steering system maintenance typically involves checking for fluid level, incorrect belt adjustment, system leaks, and other troubles. It may also include lubricating ***ball sockets***.

Checking power steering fluid. To check the level of fluid in the power steering system, the engine should not be running. Set the parking brake and place the transmission in park or in neutral.

Unscrew and remove the cap from the power steering reservoir. The cap will normally have ***a dipstick***. ***Wipe off*** the dipstick and ***reinstall*** the cap. Remove the cap and inspect the level of fluid on ***the stick.***

Most power steering dipsticks will have ***markings*** for checking the fluid when HOT and COLD. Make sure you read correct marking on the dipstick. The fluid will rise on the stick as the system warms.

Do not ***overfill*** the system. Overfilling could cause fluid to spray out the top of the reservoir onto the engine and other components.

An automatic transmission fluid is commonly used in a power steering system. Since there are several types of transmission fluids, obtain and install the right kind.

SERVICING POWER STEERING HOSES. Always inspect the condition of power ***steering hoses*** when checking a power steering system. The high pressure hose can be exposed to tremendous pressure. If this hose ***ruptures***, a sudden and dangerous loss of power assist can occur.

DANGER! Power steering pump pressure can exceed 1000 psi (6895 kPa). This is enough pressure to cause serious eye injury. Wear eye protection when working on a power steering system.

When installing a new hose, use ***a flare nut*** or ***tubing wrench***. Start the new hose fitting by hand to avoid ***cross threading***. Tighten the hose fittings properly.

Make sure the hose does NOT rub on moving or hot parts. This could cause hose failure.

SERVICING POWER STEERING BELTS. A loose power steering belt can slip, cause belt ***squeal*** and ***erratic*** or high steering effort. A worn or cracked

belt may ***snap***. This could cause a loss of power assist. Always inspect the belt very closely.

CAUSION! When tightening a power steering belt, do NOT ***pry on*** the side of the pump. If the thin housing of the pump ***is dented*** the pump can be ruined. Only pry on ***a reinforced flange*** or recommended point.

To install a new power steering belt, ***loosen*** the bolts holding the power steering pump to its ***brackets***. Push ***inward*** on the pump to release tension.

Obtain the correct belt and install it in reverse order. Pry on a recommended point when adjusting belt tension to ***specs***.

Упражнение 1

Ответьте на вопросы по тексту

1. What are the basic kinds of the steering system? 2. What are the functions of the steering system? 3. What is the steering system composed of? 4. What is the steering wheel used for? 5. What is the function of the steering shaft? 6. What supports the steering wheel and the steering shaft? 7. What is the steering gearbox used for? 8. What is the function of the steering linkage? 9. What does the steering system maintenance involve? 10. What should you do first to check power steering fluid? 11. Should you remove the cap from steering reservoir to inspect the level of fluid on the stick? 12. What is used to check the fluid when hot or cold? 13. What can the overfilling cause? 14. Where is an automatic transmission fluid used? 15. Should you inspect the condition of power steering hoses while checking a power steering system? 16. What pressure can cause serious eye injury? 17. What do you use when installing a new hose? 18. What causes hose failure? 19. What can a loose power steering belt cause? 20. May you pry on the side of the pump when tightening a power steering belt? 21. What should you do to install a new power steering belt?

Упражнение 2

Найдите в тексте английские эквиваленты к следующим словосочетаниям: безопасное управление; направление передних колес; степень усилия; ямы на дороге; движение на повороте; движение по прямой; на стоянку; откручивать; обычно используется; неожиданные и опасные потери; повреждение шланга; обратный порядок.

Упражнение 3

Переведите слова, данные в скобках, на английский язык

1. There are two kinds of steering system: linkage and (реечное) steering. 2. One of the functions of the steering system is to transmit (способность чувствовать дорогу) to the driver's hands. 3. (Руль) is used by a driver to rotate the steering shaft that passes through (рулевая колонка). 4. (Поворотный кулак) and wheels are connected with the steering gearbox by steering linkage. 5. Steering system maintenance involves lubricating (шаровой сухарь) 6. (Крышка) of the power steering reservoir has (щуп). 7. Most power steering dipsticks will have (маркировка) for checking the fluid when hot and cold. 8. (Переполнение) of the system could cause fluid to spray out the top of the reservoir onto the engine. 9. If there is a loose power belt, it can cause belt (скрип). 10. To install a new power steering belt, (ослабьте) the bolts holding the power steering pump to its (кронштейны).

Упражнение 4

Подберите соответствующие определения к следующим терминам: squeal, steering shaft, to install, specs, steering gear, steering wheel, steering knuckle.

1. To set up any part, accessory, option or kit for use on a vehicle. 2. A front-suspension part that acts as a hinge to support a front wheel and permit it to be turned to steer the car. 3. Information and service procedures provided by the

manufacturer for each automobile system and its components, operation. 4. A continuous, high-pitched, low-volume noise. 5. That part of the steering system that is located at the lower end of the steering shaft, changes the rotary motion of the steering wheel into linear motion of the front wheels for steering. 6. The shaft extending from the steering gear to the steering wheel. 7. The wheel, at the top of the steering shaft, which is used by a driver to guide or steer the vehicle.

GRAMMAR: PARTICIPLES

Participle I (present) Participle II (past)

V + ING (III форма глагола)

	ACTIVE	PASIVE
Present	**Reading** Читающий, читая	**Being read** 1) читаемый (тот, который читают) 2) будучи читаемым (когда его читали) 3) будучи прочитанным (когда его прочитали)
Perfect	**Having read** прочитав	**Having been read** Будучи прочитанный (когда его прочитали)
Past		**Read** прочитанный

Упражнение 5

Переведите слова, данные в скобках, на русский язык, обращая внимание на причастия.

1. Everybody looked at the (движущийся) fast motor vehicle. 2. The man (работающий) in the garage is my father. 3. He stopped before the (закрытой) door. 4. The service manual (используемый) in the work is rather good. 5. (Проверив) the equipment they started the experiment. 6. I picked up the tools (лежащие) on the floor. 7. The text (который читают) is about new types of the piston rings. 8. (Сделав) his homework he went to sleep. 9. (Будучи занятым) the mechanic couldn't check all the systems of your car. 10. The plant (строящийся) here will be put into operation next year. 11. (Переходя) the street you first look to the left and then to the right.

Упражнение 6

Переведите предложения, обращая внимание на причастия

1. Without lubrication, friction between rubbing parts would destroy an engine very quickly. 2. While the engine running the oil pump pulls motor oil out of the oil pan. 3. The filtered oil flows to the crankshaft, the rocker arm and other parts. 4. When learning auto mechanics, it is easy to get excited about your work. 5. It is not safe to work under a car held only by a floor jack. 6. Being instructed, you may use any new or unfamiliar power tool, lift, or other shop equipment. 7. Smoking in the shop area, you may cause a serious fire hazard. 8. Having made many experiments the engineers learned the properties of the new lubricating oil. 9. Steel is a metal used for making many motor vehicle components. 10. The results obtained during the experiment were discussed by the entire group.

ТЕКСТ 2

SUSPENSION SYSTEM

ride – езда
cornering – движение на повороте
body roll – крен кузова
to lean – наклоняться
firm – твердый
body squat – припадание кузова
to tilt – наклоняться
body dive – “ныряние” кузова
spring – пружина
swivel joint – поворотное соединение
damping – амортизирующий
movable arm – подвижный рычаг
to fasten – закреплять
control arm – рычаг управления
wheel hub – ступица колеса
ball joint – шаровой шарнир
to flex – гнуться
damper – амортизатор
arm bushing – втулка
extension – растяжение
sleeve – гильза
to swing up – качаться
bounce up – подпрыгивать

The suspension system works with tires, frame or unit body, wheels, wheel bearings, brake system and steering system. All of the parts in these system work together to provide a safe and comfortable means of transportation.

A suspension system has several important functions:

1. Support the weight of the frame, body, engine, transmission, and passengers.
2. Provide a smooth, comfortable ***ride*** by allowing the wheels and tires to move up and down with minimum movement of the car body.
3. Allow rapid ***cornering*** without extreme ***body roll*** (car ***leans*** to one side).
4. Keep the tires in ***firm*** contact with the road, even after striking bumps or holes in the road.
5. Prevent excessive ***body squat*** (body ***tilts*** down in rear) when accelerating or when carrying a heavy load.
6. Prevent excessive ***body dive*** (body tilts down in front) when braking
7. Allow the front wheels to turn from side-to-side for steering.
8. Work with the steering system to help the wheels in correct alignment.

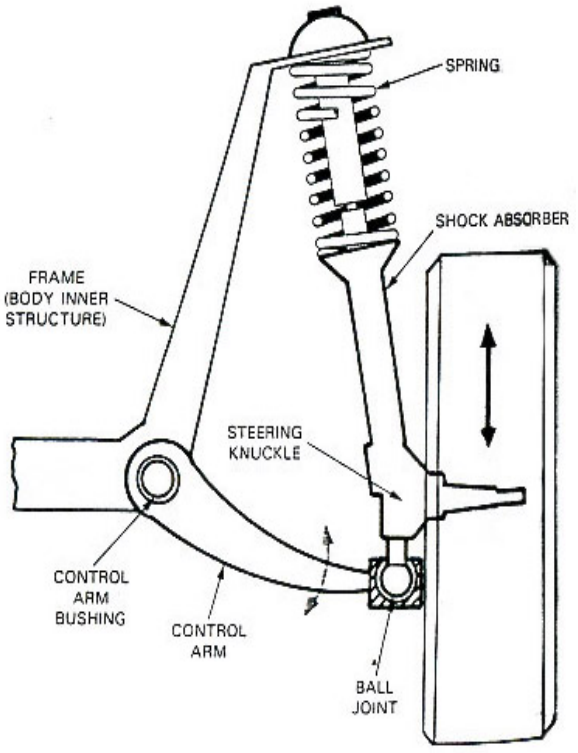

Рис. 8

A suspension system uses ***springs***, ***swivel joints***, ***damping*** devices, ***movable arms*** and other components to accomplish these functions.

Before discussing each component in detail, you should be able to visualize each major part (рис. 8) and how it functions in relation to the other parts:

1**.** ***Control arm*** (movable lever that ***fastens*** steering knuckle to the car frame or unitized body).

2. ***Steering knuckle*** (provide spindle supports for mounting ***wheel hub***, bearings, wheel assembly).

3. ***Ball joint*** (swivel joint that allows control arm and steering knuckle to move up or down and from side to side).

4. ***Spring*** (supports weight of car, ***flexes*** to permit control arm and wheel to move up and down).

5. ***Shock absorber*** or ***damper*** (keeps suspension from continuing ***to bounce up*** and down after spring compression and ***extension***).

6. ***Control arm bushing*** (***sleeve*** that allows control arm ***to swing up*** and down on frame).

Упражнение 7

Ответьте на вопросы по тексту

1. What systems does the suspension system work with? 2. What is the function of the suspension system? 3. What is a smooth ride provided by? 4. What components does the suspension system use to accomplish its functions? 5. What are the parts of the suspension system? 6. What is the control arm? 7. What is the function of the spring? 8. What is the ball joint? 9. What is damper used for? 10. What allows the control arm to swing up and down on the frame?

Упражнение 8

Переведите слова, данные в скобках, на английский язык

1. A suspension system provides a smooth, comfortable (езду) by allowing the wheels and tires to move up and down. 2. (Крен кузова) means the car leans to one side. 3. The steering system must keep the tires in (твердом) contact with the road. 4. The steering system also prevents excessive (припадание кузова) when accelerating or carrying heavy loads. 5. (Рычаг управления) is a movable

lever that fastens steering knuckle to the car frame. 6. (Пружина) supports weight of the car flexes to permit the control arm and the wheel to move up and down. 7. To keep suspension from continuing to bounce up and down after spring compression (амортизатор) is used. 8. (Втулка управления) is a sleeve that allows the control arm to swing up and down on the frame.

ТЕКСТ 3

SUSPENSION SYSTEM DIAGNOSIS

steering wheel pull – тяга руля
shimmy – угловое колебание колес
wheel alignment angles – углы регулировки колес
worn – изношенный
sideways – боком, на бок
to cock – наклонять
rough – неровный
to strike – ударять
oscillation – колебание
to jounce – ударять, трясти
to rebound – отскакивать, отражаться
loose – неплотно сидящий
clanking – лязганье
banging – грохотание
to hammer – бить
shock bounce test – проверка на отскок от удара
to release – отсоединять
to split – трескаться
to rust – ржаветь
penetrant – проникающее вещество
thread – резьба
stud – болт
nut – гайка

Suspension system problems usually show up as abnormal noises, tire wear, ***steering wheel pull*** or front end ***shimmy*** (side to side vibration). You must make sure that the trouble is in the suspension and NOT in the steering, wheel bearings, tires or other relayed parts. Suspension system wear can upset the operation of the steering system and change ***wheel alignment angles. Worn*** ball joints may let the steering knuckles tilt ***sideways*** on their control arms. This, in turn, allows the wheels and tires ***to cock*** or lean. To begin diagnosis of a

suspension system, talk to the customer or service manual writer. Then, either inspect the parts that could cause the problem or test drive the car.

SHOCK ABSORBER SERVICE. Worn shock absorbers will cause a car to ride poorly on ***rough*** roads. When the tire ***strikes*** a bump, the bad shock does not dampen spring ***oscillations***. The suspension system will continue ***to jounce*** and ***rebound***. This movement is transferred to the frame, body, and passenger compartment. A ***loose*** or damaged shock absorber may produce a loud ***clanking*** or ***banging*** sound. The rapid up and down suspension movement can ***hammer*** the loose shock absorber against the body or control arm.

Checking shock absorber condition. A shock bounce test and visual inspection will normally locate shock absorber problems.

To perform ***a shock bounce test***, simply push up and down on each corner of the car body. Then ***release*** the body and count the number of times the car moves up and down. Generally good shock absorbers should stop body movement in two or three rebounds. Bad shock absorbers will let the body bounce over three times.

Also inspect the shock absorbers for signs of leakage (oily wetness) and damage. If the shock absorber is leaking oil, new ones are needed. Check the rubber bushings on each end of the shock absorber. They should not be smashed or ***split***. Make sure the shock absorber fasteners are tight.

Replacing shock absorbers. When shock absorber replacement is needed, the wheels and tires must be usually removed. Place the car on jack stands.

WARNING! With suspension systems, you must place the jack stands or lift devices under the control arms or axle. This will keep the control arms or axle from flying downward when the shock is unbolted.

Remove the old shock absorbers. If the fasteners ***are rusted***, spray rust ***penetrant*** on the ***threads***. When a threaded ***stud*** and ***nut*** are used, you may need

to hold the stud while turning the nut. Install the new shock absorber in reverse order of removal.

Упражнение 9

Ответьте на вопросы по тексту

1. What are the main problems of the suspension system? 2. What can change wheel alignment angles? 3. What troubles may the worn ball joints cause? 4. What sound will a loose or damaged shock absorber produce? 5. How can you perform a shock bounce test? 6. What should good and bad shock absorbers do? 7. What should you inspect in the shock absorber? 8. Must the wheels and tires be removed while replacing the shock absorber? 9. In what case should you spray rust penetrant? 10. What is the most common problem with air shocks?

Упражнение 10

Подберите соответствующие определения к следующим терминам:

control arm, damper, stud, ball joints, oscillation, nut, spring, wheel alignment

1. A flexible joint consisting of a ball within a socket used in front-suspension system. 2. A part of the suspension system designed to control wheel movement precisely. 3. A removable fastener used with a bolt to lock pieces together. 4. A movement back and forth, as a swinging pendulum. 5. A headless bolt that is threaded on both ends. 6. A series of tests and adjustments to ensure that wheels and tires are properly positioned on the vehicle. 7. A device that keeps suspension from continuing to bounce up and down after spring compression and extension. 8. A part in a system that supports weight of the car, flexes wheel to move up and down.

Упражнение 11

Переведите предложения, обращая внимание на независимый причастный оборот

1. This motor plant supplied with good materials, the quality of its products has been much improved. 2. The shock absorbers being worn, the driving of the car was poor on the rough road. 3. Many technical and scientific problems having been solved, the new type of the economic engine could be realized. 4. The corners of the car body being pushed up and down, a shock bounce test was performed. 5. The fuel exhausted, the engine stopped. 6. Electrons moving through a wire, electrical energy are generated. 7. The shock absorber replacement needed, the wheels and tires have been removed. 8. The experiment having been completed, we could obtain the results. 9. The street being dark, I switch on the lights of my car. 10. The shock absorber fasteners have been tight, we could check rubber bushing on each end of the shock absorber.

GRAMMAR: **GERUND**

V + ING

	ACTIVE	PASSIVE
INDEFINITE	**Writing** (писать)	**Being written** (чтобы ему писали)
PERFECT	**Having written** (написал)	**Having been written** (чтобы ему написали)

Герундий употребляется после:

to avoid	**to forgive**	**to enjoy**	**to mind**
to excuse	**to stop**	**to bust out**	**to give up**
to finish	**to put off**	**to deny**	**to keep (on)**
cannot help	**to go on**		

Упражнение 12

Переведите предложения, обращая внимание на герундий

1. This car is designed for carrying more than five passengers. 2. We could leave the laboratory after having finished our last experiments. 3. I cannot help admiring the design of this new motor vehicle. 4. When the mechanic finished checking the system, he could start the engine. 5. We were glad to learn about a new service workshop having been built in our region. 6. Removing a fuel injector seems to be simple in theory but sometimes turns out difficult in practice. 7. There are two ways of lubricating the parts of the engine: by gravity and by splash. 8. Most of experiments being carried out are connected with components design improvements. 9. Do you mind my inspecting the whole engine?

ТЕКСТ 4

BRAKE SYSTEM

dual hydraulic brake system – сдвоенная гидравлическая тормозная система
to equalize – выравнивать
anti-skid system – противоскользящая система
master cylinder – главный цилиндр
brake booster – усилитель тормоза
application – применение
brake line – тормозная магистраль
wheel brake assembly – комплект колесного тормоза
emergency (parking) brake – стояночный тормоз
rear – задний
cable – трос
treatment – обработка
rarely – редко
timing chain – цепь привода распределительного механизма

Automobile brakes provide a means of using friction to slow down, stop or hold the wheels of the car. When a car is moving down the highway, it has a tremendous amount of stored energy in the form of inertia (tendency to keep moving). To stop the car, the brakes convert kinetic (moving) energy into heat. A modern automobile uses numerous devices to improve braking ability. For

example, ***dual hydraulic brake systems***, hydraulic valves ***to equalize*** braking pressure, and computer controlled ***anti-skid systems*** are found on today's cars. Before detailing the construction and operation of each part, you should have a basic understanding of a brake system. Study the location of the parts as they are introduced:

1. ***Brake pedal assembly*** (foot lever for operating master cylinder and power booster).

2. ***Master cylinder*** (hydraulic piston type pump that develops pressure for brake system).

3. ***Brake booster*** (vacuum or power steering operated device for assisting brake pedal ***application***).

4. ***Brake lines*** (metal tubing and rubber hose for transmitting pressure to wheel brake assemblies).

5. ***Wheel brake assemblies*** (devices that use system pressure to produce friction for slowing or stopping wheel rotation).

6. ***Emergency or parking brake*** (mechanical system for applying ***rear*** wheel brake assemblies).

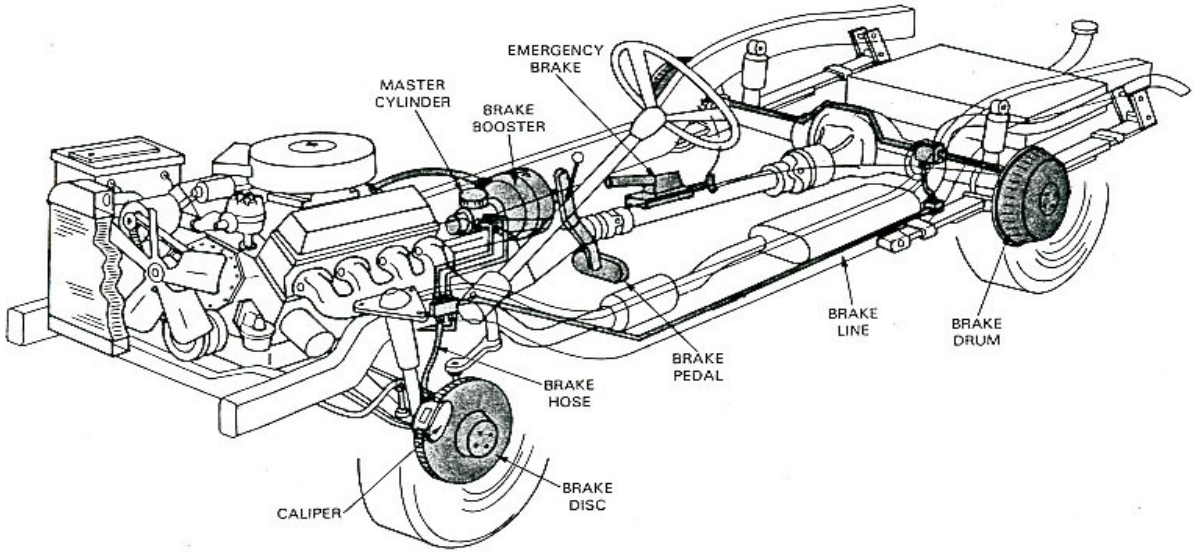

Рис. 9

When the driver pushes on the brake pedal, lever action pushes a rod into the brake booster and master cylinder. This produces hydraulic pressure in the master cylinder. Fluid flows through the brake lines to the wheel brake assemblies. The brake assemblies use this pressure to cause friction for braking.

An emergency or parking brake system uses ***cables*** to mechanically apply the rear brakes. This provides a system for holding the wheels on hills or during complete hydraulic brake system.

BRAKE TROUBLE DIAGNOSIS. Trouble diagnosis is more than following a series of steps in an attempt to find the solution to a problem. It is a way of looking at systems that are not working properly. Here are the basic rules:

1. Know the system. This means that you should know that part go together, how they work together as a system, and what happens if some part goes bad or the parts fail to work together as they should.

2. Know the history of the system in the car. How old is the system? What sort of ***treatment*** has it had? What is its service history? Has it been serviced before for the same problem? The answers to these questions might save you a lot of time.

3. Know the history of the condition causing the driver's complaint. Did it start all at once? Did the trouble come on gradually? Was it related to some other condition, like the accident or to a previous service problem?

4. Know the odds. Some troubles happen more often than others. Be aware of what happens frequently and what happens ***rarely***. A trouble such as "the engine cranks normally but does not start" is more likely to be caused by an empty fuel tank than by a broken ***timing chain***.

Упражнение 13

Ответьте на вопросы по тексту

1. What do the automobile brakes provide? 2. When does a car have a tremendous amount of stored energy? 3. When do the brakes convert kinetic energy into heat? 4. What devices can you find in modern automobiles to improve braking ability? 5. What does the brake system consist of? 6. What is a brake pedal assembly? 7. What is a master cylinder? 8. What do we call a vacuum or power steering operated device for assisting brake pedal application? 9. What do the brake lines used for? 10. What are the wheel brake assemblies? 11. What is mechanical system for applying rear wheel brake assemblies called? 12. What knowledge can help you to diagnose the brake trouble?

Упражнение 14

Переведите слова, данные в скобках, на английский язык

1. Such devices as computer controlled (противоскользящая система) can be found on modern cars to improve the brake system. 2. Automobile brakes provide a means of using (трение) to slow down or to stop the car. 3. (Главный цилиндр) is a hydraulic piston type pump that develops pressure for the brake system. 4. Vacuum or power steering operated device for assisting the brake pedal application is called (усилитель тормоза). 5. Fluid flows through (тормозную магистраль) to the wheel brake assemblies. 6. An emergency brake system uses (тросы) to mechanically apply (задние) brakes. 7. When you look at the system that is not working properly, you should know what sort of (обработки) it has had. 8. This sort of trouble is more likely to be caused by an empty fuel tank than by a broken (цепью привода распределительного механизма). 9. A modern automobile uses (гидравлические) valves (чтобы выровнять) braking pressure.

Упражнение 15

Подберите соответствующие определения следующим терминам: inertia, timing chain, brake fluid, brake pedal, brake lines, dual brake system, a brake, skid-controlled system, master cylinder

1. The food actuated lever the driver depresses to cause brake application. 2. A chain that is driven by a sprocket on the crankshaft and that drives the sprocket on the camshaft. 3. The tubes or hoses connecting the master cylinder and wheel cylinder in a hydraulic brake system. 4. An energy-conversion device used to slow, stop or hold a vehicle or mechanism. 5. A special fluid used in hydraulic brake system which is incompressible and transmits hydraulic force form the master cylinder to the wheel cylinders. 6. A car brake system using two separate hydraulic systems, which may be split front and rear or diagonally. 7. Property of an object that causes it to resist any changes in its speed or direction of travel. 8. The liquid-filled cylinder in the hydraulic brake system in which hydraulic pressure is developed when the drive depresses a foot pedal. 9. A system which responds a locking wheel by relieving hydraulic pressure to the locking brake.

ТЕКСТ 5

CHECKING BRAKE PEDAL ACTION

accurate – точный
pedal height – высота педали
pedal free play – свободный ход педали
pedal reserve distance – расстояние запаса хода педали
at rest – в состоянии покоя
maladjusted – плохо закрепленный
push rod – толкатель
initially – первоначально
brake adjuster –механизм регулировки тормоза
brake light – окно
bulb – лампа накаливания
fuse –плавкий предохранитель
switch – переключатель
brake booster – усилитель тормоза
to harden – затверделый
swollen – распухший

brake drag – прихватывание тормоза
power brake – тормоз с усилителем
sealed – запломбированный
exact – конкретный

Checking brake pedal action. A fast and ***accurate*** way of checking many components of the brake system is the *brake pedal check.* This is done by applying the brake pedal and comparing its movement to specs. The three brake pedal application specs (distances) are: pedal height, pedal free play, and pedal reserve distance.

Brake pedal height is the distance from the pedal to the floor with the pedal ***at rest***. If height is incorrect, it usually points to problems in the pedal mechanism. There may be worn pedal bushings, weak return spring, or ***maladjusted*** master cylinder ***push rod***.

Brake pedal free play is the amount of pedal movement before the beginning of brake application. It is the difference between the "at rest" and ***initially*** applied positions. Brake pedal free play is needed to prevent ***brake drag*** and overheating. If pedal free play is NOT correct, check the adjustment of the master cylinder push rod.

A worn pedal bushing or a bad return spring can also increase pedal free play.

Brake pedal reserve distance is measured from the car floor to the brake pedal with the brakes applied. Typically, brake pedal reserve distance should be 2 in. (51 mm) for manual brakes and 1 in. (25 mm) for ***power brakes.*** If brake pedal reserve distance is incorrect, check push rod adjustment.

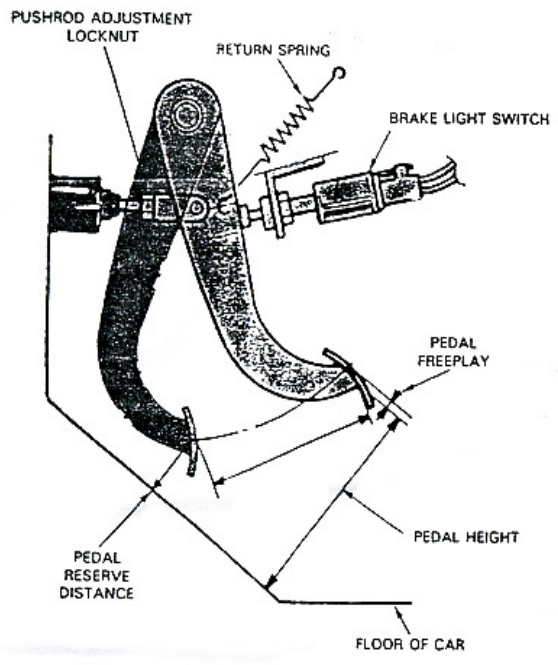

Рис. 10

Also, there may be air in the system or ***the brake adjusters*** may not be working. Numerous other problems can cause incorrect pedal reserve distance.

When checking brake pedal action, apply and hold the brake pedal firmly for about 15 seconds. The engine should be running if the car has power brakes. Try to detect any system leakage which would cause the pedal to slowly move towards the floor. Also, make sure the pedal is firm and returns properly.

While checking the brake pedal, you should also make sure ***the brake lights*** are operating. If they do not work, check ***the bulbs, fuses,*** or ***switch***.

VACUUM BOOSTER SERVICE

When a car has vacuum type power brakes, you should inspect the brake booster and vacuum hose. Make sure the vacuum hose from the engine is in good condition. It should NOT ***be hardened***, cracked, or ***swollen.*** Also, check the hose fitting in the booster.

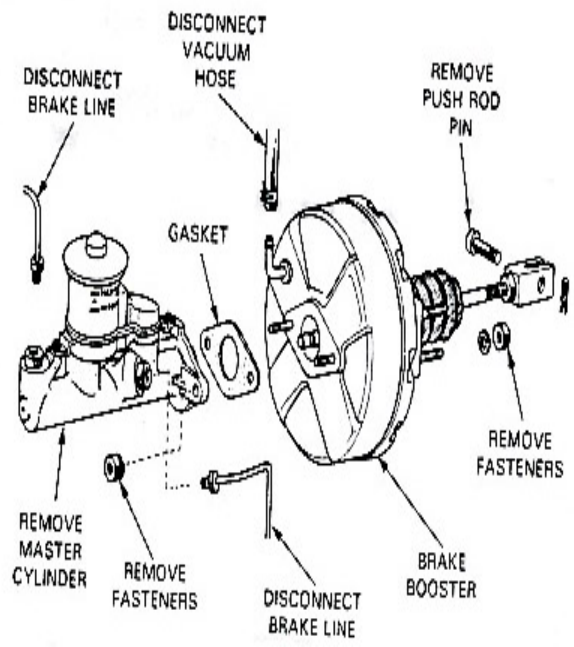

Рис. 11

To test the vacuum booster, pump the brake pedal several times so remove any vacuum from the booster. (рис. 11) Then, press and hold down lightly on the brake pedal as you start the engine. If the vacuum booster is functioning, the brake pedal will move downward slightly as soon as the engine starts.

Many shops do NOT rebuild vacuum brake boosters.

Instead, they install a new or factory rebuilt unit. Some boosters ***are sealed*** and cannot be disassembled. A rebuild normally involves replacing the

diaphragm, valves, and other plastic or rubber parts. Refer to a service manual for ***exact*** procedures on the particular booster.

Упражнение 16

Ответьте на вопросы по тексту

1. Is the brake pedal check accurate way of checking many components of the brake system? 2. What are the three brake pedal application specs? 3. What is the brake pedal height? 4. What problems can occur in the pedal mechanism, if height of the pedal is incorrect? 5. What is the brake free play? 6. Why is the brake free play needed? 7. How is the brake pedal reserve distance measured? 8. What is the typical brake pedal reserve distance? 9. What should you check if the brake pedal reserve is incorrect? 10. What should you inspect in a car which has vacuum type power brakes? 11. What should you do while testing the vacuum booster? 12. What do many shops do instead of rebuilding vacuum brake boosters? 13. What boosters cannot be disassembled? 14. What does a booster rebuilding involve?

Упражнение 17

Переведите слова, данные в скобках, на английский язык

1. A fast and (точный) way of checking many components of the brake system is the brake pedal check. 2. The distance from the pedal to the floor with the pedal at rest is called (высота педали). 3. (Свободный ход педали) is needed to prevent (прихватывание тормоза) and overheating. 4. (Расстояние запаса хода педали) is measured from the car floor to the brake pedal with the brake applied. 5. If height of the pedal is incorrect, there may be (плохо закрепленный) master cylinder (толкатель). 6. While checking the brake pedal, you should also make sure (окна) are operating. 7. Check (лампы накаливания, плавкие предохранители, переключатели) if the brake lights do not work.

8. When a car has vacuum type power brakes, you should inspect (усилитель тормоза) and vacuum hose. 9. Some boosters (запломбированы) and cannot be disassembled. 10. For (конкретные) procedures on the particular booster, refer to a service manual.

Упражнение 18

Переведите предложения на русский язык, обращая внимание на герундий.

1. Проверка педали тормоза – быстрый и точный способ проверки многих компонентов тормозной системы. 2. Мы закончили проверку действия педали тормоза. 3. Они настаивали на сравнении движения педали с техническими характеристиками. 4. Я не возражаю против изменения расстояния запасного хода педали тормоза. 5. Я думал о том, как начать применение нового тормоза. 6. Попытка обнаружить проблемы в системе с помощью нового прибора была неудачной. 7. После обнаружения утечки в системе мы поняли, почему педаль двигалась медленно. 8. Для отведения вакуума из системы тормоза подкачайте педаль тормоза несколько раз. 9. Мы не могли не обратиться к инструкции по обслуживанию автомобиля за конкретным описанием процедуры.

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