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English for Mechanics

Навчальний посібник

Бондар Г.Ю.

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English for Mechanics: навчальний посібник для студентів технікумів та коледжів, які навчаються за спеціальністю ОБСЛУГОВУВАННЯ ТА РЕМОНТ АВТОМОБІЛІВ ТА ДВИГУНІВ. ТРАНСОРТ Бондар Г.Ю., 2017- 72 с.

Навчальний посібник призначений для студентів які навчаються за спеціальністями «Транспорт», «Ремонт та обслуговування автомобілів».

Поданий навчальний матеріал направлений на формування у студентів іншомовної професійної компетенції. Містить автентичні тексти, які охоплюють основні напрямки даної спеціальності, різноманітні вправи на розвиток монологічно та діалогічного мовлення, додаткові тексти для читання. Вправи передбачають поглиблену роботу студентів як на заняттях, так і під час самостійного опрацювання означеного матеріалу.

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Unit 1. The Profession of a Car Mechanic

“No other man-made device since the shields
and lances of ancient knights fulfills
a man's ego like an automobile.”

WILLIAM ROOTES

I. Pre-reading exercises.

Basic vocabulary

automobile maintenance- технічне обслуговування автомобілів
modification-модифікація
repair-ремонтувати
to diagnose the problem-діагностувати проблеми
accurately-точно
to quote prices-визначати ціну
commencing-починатися
partial disassembly-часткове розбирання
electronic means of gathering data-електронні засоби збору даних
the repair of a specific part-ремонт певної частини
the replacement of one or more parts-заміна однієї або декількох запчастин
preventative maintenance-профілактичне обслуговування
misunderstood aspect-незрозумілий аспект
scheduled replacement-планова заміна
to avoid far more expensive damage-щоб уникнути набагато більш дорогих ушкоджень
with the rapid advancement-з швидким просуванням
automotive service technician-спеціалісти по технічному обслуговуванню автомобілів
fading quickly-швидко зникати
automobile dealerships-автосалони
sophisticated diagnostic computers-складні діагностичні комп'ютери

Exersice 1. Read and translate the text.

Car mechanic

A car mechanic (or car mechanic in British English and motor mechanic in Australian English) is a mechanic who specializes in automobile maintenance, repair, and sometimes modification. The mechanic may be knowledgeable in working on all parts of a variety of car, makes or may specialize either in a specifi c area or in a specific make of car. In repairing cars, their main role is to diagnose the problem accurately and quickly. They often have to quote prices for their customers before commencing work or after partial disassembly for inspection. The mechanic uses both electronic means of gathering data and their senses. Their job may involve the repair of a specific part or the replacement of one or more parts.

Basic vehicle maintenance is a fundamental part of the mechanic's job in some countries. Preventative maintenance is also a fundamental part of the mechanic's job, but this is not possible in the case of vehicles that are not regularly maintained by the mechanic. One misunderstood aspect of preventative maintenance is "scheduled replacement" of various parts, which occurs before failure to avoid far more expensive damage. Because this means that parts are replaced before any problem is observed, many vehicle owners will not understand why the expense is necessary.

With the rapid advancement in technology, the mechanic's job has evolved from purely mechanical, to include electronic technology. Because vehicles today possess complex computer and electronic systems, mechanics need to have a broader base of knowledge than in the past. The term "auto mechanic" is being used less and less frequently and is being replaced by the title "automotive service technician". Fading quickly is the day of the mechanic, who needed little knowledge of today's computerized systems. Most automobile dealerships now provide sophisticated diagnostic computers to teach technician, without which they would be unable to diagnose or repair a vehicle.

Exercise 2. Match a–g with 1–7.

a) preventive maintenance b) maintenance c) repair d) to diagnose e) partial disassembly f) replacement g) failure	1) діагностувати 2)профілактичне обслуговування 3) поломка 4)заміна 5) ремонт 6) обслуговування 7) часткова розборка

Exercise 3. Put in prepositions where necessary.

1. A car mechanic specializes … automobile repair.
2. Mechanics should be knowledgeable in working … all parts of cars.
3. This job involves the replacement … some parts.
4. Nowadays mechanics need to have more knowledge than … the past.
5. Most dealerships provide diagnostic computers … teach technician.

Exercise 4. Find the passages in the text above for which the next word combinations would be the key words:

1. car mechanic's job
2. electronic technologies
3. vehicle maintenance

Exercise 5. Answer the questions. Using these question make up dialog and perform it with your partner.

1. What is a car mechanic called in Australian English?
2. What are the main functions of the car mechanic?

3. Does the mechanic's job include electronic technology?
4. Do most automobile dealerships now provide sophisticated diagnosticcomputers to each technician?

Additional exercises

Exercise 1. Read and translate the text.

Car mechanics repair and maintain cars. Some mechanics work on all parts of any car, while others specialize in one area or on one type of car. The most challenging aspect of car repair is often the mechanic's favourite part: diagnosing the problem. Speed and accuracy in diagnosis and quoting prices to the customer are crucial if the mechanic intends to keep long-term clients. The mechanic examines the engine while it is running (if possible) to see if his initial assumptions are correct.

Electronic diagnostic equipment is useful but the good mechanic can tell a lot by using eyes, ears, a nose as he searches for problems. Sometimes he repairs parts, but if the part is worn or damaged, he replaces it. Some mechanics compare their field to that of the physician, because most people come to them only when their car is in dire straits. When people come in for an automotive check-up, mechanics often replace worn parts before they become hazardous to the driver, even though drivers can be suspicious of mechanics who recommend the replacement of parts that haven't stopped functioning.

The best mechanics have mastery of a wide variety of integrated skills: electrical systems (a car's wiring is more complicated than an average home's); computerized electronics (a television set seems simple by comparison); fuel system (a car's "plumbing" is a Byzantine maze of tubes). Car mechanics proudly compare themselves to doctors, since they mainly see people with complaints; but whereas the human body and its problems have remained essentially unchanged for millennia, the designs of cars change every year. As a result, the job requires more preparation than ever before.More and more, cars are controlled by electronic instruments, so mechanics are using computers constantly. "Computers have become as much a part of the tool box as wrenches," said one mechanic.

Most car mechanics start in an automotive repair school, then work full time at the same dealerships. They read trade papers daily to know about of changes and trends in their industry. As they gain experience they can move into higher-paying, specialized positions. They can also rise to the ranks of supervisor or manager, particularly if they have strong interpersonal skills to calm cranky customers who are displeased by high service bills and inconvenience.

Exercise 2.Using the information from the text, make up the list of operations which car mechanics must perform. Write them down into your exercise-books.

Exercise 3. Answer the following questions.

1. Which of the operations (exercise 2) can you manage?
2. Do you agree that “electronic diagnostic equipment is useful but the good mechanic can tell a lot by using eyes, ears, a nose as he searches for problems”. Explain your point of view.
3. Why do car mechanics compare themselves to doctors? What is similar and what is different in their work?
4. What is the way car mechanics can move into higher-paying positions?

Exercise 4. Choose from the list below characteristics, which you consider necessary in your profession, add others if necessary.

Accurate, tolerant, patient, sociable, good-mannered, exact, cautious, attentive, hardworking, scrupulous, sharp, widely-read, competent, organised, impulsive, impatient, balanced.

Unit2.The Automobile Components

Aerodynamics are for people who can't build engines.
– Enzo Ferrari

I. Pre-reading exercises.

1. Read and remember the following words.

engine— двигун
chassis —шасі
body — кузов
power train —силовий
running gear – ходова частина
steering system – система управління
brakes —гальма
clutch - щеплення
gearbox — коробка передач, трансмісія
propellershaft —карданный вал
finaldrive – система приводу
differential - дифференціал
rear axle — задняя вісь
axle shafts — півосі
frame with axles — рама з вісями
wheels and springs —колеса і пружини
hood — капот
fenders — крила
heater - нагрівач
windshield wiper — склоочисник
include — включати
consist of — складатися з
as well —також
in turn — всвоючергу
source of power —джерелоенергії
fuel — паливо
cooling — охолодження
lubricating — мастильний

II. Reading.

1. Read and translate the following text and do the exercises after the text.

TEXT

Components of the Automobile

The automobile is made up of three basic parts: the power plant, or the engine, the chassis and the body.

The engine is the source of power that makes the wheels rotate and the car move. It includes fuel, cooling, lubricating and electric systems. Most automobile engines have six or eight cylinders.

The chassis includes a power train (power transmission), a running gear, steering and braking systems as well.

The power train carries the power from the engine to the car wheels.

The power transmission, in turn, contains the clutch, gearbox, propeller or cardan shaft, final drive, differential, rear axle and axle shafts. The running gear consists of a frame with axles, wheels and springs.

The body has a hood, fenders and accessories: the heater, stereo tape recorder, windshield wipers, conditioner, speedometer and so on.

2. ***Choose and write down the terms which refer to the engine , the chassis , the body.***

Fuel system, axle shaft, accessories, cooling system, frame with axles, running gear, lubricating system, steering system, heater, propeller shaft, power transmission, final drive, windshield wiper, clutch, wheels and axle shafts, gearbox, electric system, differential.

Give the Ukrainian equivalents of this words.

3. ***Answer the questions about the text:***

1.What main parts is the automobile made up of?
2.What is the function of the engine?
3.What systems does the engine include?
4.What does the chassis consist of?
5.What units does the power transmission comprise?
6.What assemblies does the running gear consist of?
7.What has the body?

4. Finish the sentenceswith appropriate endings.

1. The automobile is made up of...	1. a power transmission, running gear, steering and braking systems.
2. The engine is ...	2. the clutch, gearbox, propeller shaft, final drive, differential and axle shafts.
3. The engine includes ...	3. a hood, fenders and accessories.
4. The chassis consists of...	4. the engine, the chassis and the body.
5. The power transmission comprises ...	5. a frame with axles, wheels and springs.
6. The running gear consists of.. .	6. the source of power.
7. The body has ...	7. fuel, cooling, electric and lubricating systems.

5. Find the English equivalents of the following sentences in the text.

1. Автомобіль складається з трьох основних частин : двигуна, шасі і кузова. 2. Двигун це джерело енергії. 3. Двигун складається з топливної, охолоджуючої, змащувальної та та електричної системи. 4. Шасі включає в себе силову передачу, ходову частину, кермову та гальмівну систему. 5. Силова передача(трансмісія) в

свою чергу, складається з щеплення, коробки передач, карданного вала , головної передачі, диференціала, заднього моста та піввісей. 6. Ходова частина включає в себе раму з вісями, колеса та ресори. 7. Кузов включає в себе капот , крила, допоміжні аксесуари: обігрівач, склоочисники, магнітолу, кондиціонер і т. д.

II.I. Reading.

1. Read the dialogue and then practice the conversation in pairs.

A: Do you know what parts the automobile is made up of?

B.: Certainly. It is made up of the engine, the chassis and the body.

A: What is the source of power?

B:The source of power is the engine. It includes fuel, cooling, lubricating and electric systems.

A:And what does the chassis consist of?

B:It consists of a power transmission, running gear, steering and braking systems. By the way, the power transmission, in turn, comprises the clutch, gearbox, propeller shaft, final drive, differential, rear axle and axle shafts.

A:And what has the body?

B:The body has a hood, fenders and accessories, such as: the heater, stereo tape recorder, windshield wipers, conditioner and so on.

A:Thank you very much for your information.

B:Don't mention it. I am glad to help you.

1. Find the equivalents of the following words and word-combinations in the dialogue.

Зроблений з; шасі; кузов; включати в себе; топливна, охолоджуюча, змащувальна та електрична системи; трансмісія; ходова частина;рульова та гальмівна системи; карданний вал; головна передача; диференціал; задній мост; піввісі; капот; крила; допоміжні прилади; склоочисники.

2. Finish sentences using appropriate words and word-combinations given bellow.

A:What parts does the automobile ... ?

B:It is made up of...

A: What is...?

B: The source of power is the ...

A:What systems does the engine ...?

B.:It includes ...

A: What does the chassis ... ?

B.:The chassis ....

A: What does the power train include?

B:The power train includes ...

A:What units does the body comprise?

B:It comprises ... and accessories such as ...
A.:Thank you for your ....
Engine, chassis, body, power train, running gear, steering system, brakes, clutch, gearbox, propeller shaft, final drive, differential, rear axle, axle shafts, hood and fenders, heater, windshield wipers, information, conditioner, consist(s) of, the source of power, include, fuel, cooling, lubricating, electric systems.
Perform dialogue in pairs.

III. Vocabulary Practice.

1. Match English words with their Ukrainian equivalents.

1. power plant	a.	щеплення
2. chassis	b.	силова передача
3. body	c.	головна передача
4. power train	d.	колеса
5. running gear	e.	система рульового управління
6. steering system	f.	капот
7. brakes	g.	піввісі
8. clutch	h.	ходова частина
9. gearbox	i.	паливна система
10 propeller shaft.	j.	склоочисники
11.final drive	k.	коробка передач
12 rear axle.	l.	система змащування
13 axle shafts.	m.	силова установка
14 frame.	n.	рама
15 wheels.	o.	в свою чергу
16 springs.	p.	гальма
17 hood.	q.	ресори
18 fenders.	r.	також
19 windshield wipers.	s.	шасі
20 fuel system.	t.	карданный вал
21.cooling system	u.	задній міст
22. lubricating system	v.	джерелоенергії
23.in turn	w.	системаохолодження

24.as well	х.	крила
25.source of power	у.	кузов

2. Answer the questions.

1.What main parts is the automobile made up of?
2.What is the function of the engine?
3.What systems does the engine include?
4.What does the chassis consist of?
5.What units does the power transmission comprise?
6.What assemblies does the running gear consist of?
7.What has the body?

3. Choose and write down corresponding in description variant.

1.Mechanism which is used to stop the car.
a) clutch; b) brakes; c) gearbox; d) steering system.
2.Mechanism which is used to guide the car.
a) clutch; b) brakes; c) gearbox; d) steering system.
3.Mechanism which engages or disengages the engine and the car wheels.
a) clutch; b) brakes; c) gearbox; d) steering system.
4.Mechanism which is used to change the speed of the car.
a) clutch; b) brakes; c) gearbox; d) accelerator.
5.Mechanism which is used to guide the car in one or the other directions.
a) clutch; b) brakes; c) gearbox; d) steering system.
6.Device which is designed to measure the speed of the car.
a) heater; b) windscreen; c) speedometer; d) tachometer.

Supplementary exercises

Exercise 1. Read and translate the text.

AUTOMOBILE STRUCTURE

There are numerous types of motor vehicles: passenger cars, buses, trucks,tractors and others. Each of them serves quite a definite purpose.

Every automobile has the following components: engine, power train,chassis, body.

The engine is the power plant of the vehicle. It makes the car wheel rotateand the car move. In general, internal - combustion engines are used operatingwith some fuel (petrol, benzol, diesel, oil). Depending on their combustion process,the engines are fundamentally classified as carburettor engines and dieselengines. Sometimes the carburettor engines are called heavy-oil engines. Anotherdifference results from the working method of the internal-combustion engine.A difference is made, between four-stroke cycle engine and two-stroke cycleengine.

Every engine includes the electric, fuel, cooling and lubricating systems.

The chassis consists of a power train and a frame with axles, wheels andsteering system as well. The power train carries the power from the engine to thecar wheels and consists of the clutch, gear- box or transmission, propeller shaft,rear axle, final drive, differential and axle shafts.

The body has a hood and fenders and accessories: the heater, lights, radio,windshield wiper, convertible top raiser and so on.

Exercise 2. Change the sentenseces using there is \ there are.

1. Every automobile has an engine, a chassis and a body.
2. The engine is the power plant of the vehicle.
3. A difference is made between four-stroke cycle engine and two-stroke cycle engine.
4. Every engine includes the electric, fuel, cooling and lubricating systems.
5. The chassis includes the brake system and the steering system.

Exercise 3. Retell the text using the scheme.

1. The engine is...
2. In general, internal-combustion engines are used...
3. Sometimes the carburettor engines are called...
4. Another difference results from...
5. The chassis includes...
6. The power train carries the power...
7. The body has...

Unit 3. Types of Cars. Exterior and interior parts.

“Any customer can have a car painted any color

that he wants so long as it is black."
Genry Ford

I. Pre-reading exercises.

1. Read and remember the following words.

convertible- кабріолет
coupe - купе
hatchback- хетчбек
minivan- мінівен
sedan- седан
crossover- кросовер
SUV- позашляховик
fold- складати
detach- відокремлювати
enclosed vehicle- закритий автомобіль
inclined- нахилений
cramped interior- тісний інтер'єр
reduced drastically- різко скорочуватися
incorporate- включати
cargo space- місце для багажу
to tuck all your luggage- засунути багаж
the large-hinged door- великі відкидні двері
ample space-достатній простір

II. Reading.

1. Read and translate the following text and do the exercises after the text.

TEXT

Types of cars

The term 'car', in its broadest sense, is defined as a vehicle which is used predominantly for the purpose of passenger transportation. Basically, cars can be categorized into various types on the basis of their shape, size, mechanical specifications, performance, etc.

Convertible

Convertibles are small cars with a roof which can be either folded or detached, thus allowing the user 'convert' this car from an enclosed vehicle to an open-air type. There exist two variants of this car type - soft top convertibles, wherein the roof is made of vinyl or canvas, and hard roof convertible, wherein the roof is made of plastic or steel. A few examples of convertibles are the Audi A5 cabriolet, Ford Mustang convertible and the Mazda MX-5 Miata.

Coupe

Coupes are small two-door two-seater cars, at times four-seater, with a roof which is typically inclined towards the rear. The unique design of a four-seater coupe - and its relatively cramped interior with the distance between the front and rear seats

reduced drastically, makes it appear and feel like a shortened version of a sedan type. ome of the famous

coupe models on the streets today happen to be the Bentley Continental GT Coupe, Aston Martin DBS, Chevrolet Monte Carlo, Jaguar XJ (X351), Ferrari 612 Scaglietti and Saturn Ion 4-door coupe.

Hatchback

Hatchbacks are cars which incorporate the passenger space with cargo space in such a manner that you get to tuck all your luggage inside through the large-hinged door which opens upwards and gives access to cargo space from the tailgate. Some of the most popular hatchback models seen on the road nowadays include names like the Audi S3, Geo Metro, DodgeCaliber, Mini Cooper, Chevrolet Aveo, Lexus CT 200h, etc.

Minivan

Minivans are mid-sized cars, taller than the sedans or hatchbacks, which are best known for their spacious interiors. Some of the most popular minivan models to be seen today are the Dodge Grand Caravan, Volkswagen Routan, Kia Carnival, Hyundai Entourage, Toyota Sienna,Honda Odyssey, etc.

Sedan

Sedans vary from mid-sized to large models, and typically feature two rows of seats with ample space unlike the coupe type. Honda Accord, Toyota Camry, Subaru Legacy, Ford Taurus, BMW 7 Series, etc. are some examples of sedans available in different parts of the world today.

Luxury Sedans - Maserati Quattroporte, Lincoln Town Car and Rolls-Royce Ghost

Sports Sedans - Aston Martin Rapide, Mitsubishi Lancer Evolution and Lexus IS

Crossover

Crossovers are tall wagons and SUVs that are based on a passenger-car platform's architecture (as opposed to a truck's) for improved ride, comfort and fuel economy. They come in all sizes, and many offer a third-row seat. A light-duty four-wheel-drive or all-wheel-drive system is usually optional. A few crossover examples are the Acura MDX, Chevrolet Equinox, Ford Escape and Toyota Venza.

SUV

Sport-utility vehicles offer available four-wheel or all-wheel drive and raised ground clearance in combination with a two- or four-door body. Most SUVs, like the Chevrolet Tahoe and the

Toyota 4Runner, are traditionally based on truck platforms.

Wagon

Wagons have all the same passenger room and driving characteristics as the sedans they're based on, but offer more cargo room. A few of the larger wagons even offer a third-row seat. Automakers sometimes come up with names like "Avant" or "Sportback" or avoid the term wagon altogether. Here's an easy way to determine whether a vehicle is a wagon: The roof line of a wagon continues past the rear doors. A few wagon examples are the BMW 3 Series Wagon, Ford Flex and Volkswagen Jetta Sportwagen.

III. **Post-reading exercises**

1. Answer the questions using the text:

1. Define the term *"car"*.
2. According what cars can be categorized?
3. What is a convertible car? Name the most famous among them.
4. Describe coupes.What models of coupes do you know?
5. What is a hatchback car?
6. What do you know about minivans?
7. Compare please sedan and crossover? What is a difference?
8. What cars can offer available four-wheel or all-wheel drive?
9. What are wagons?

2. Label the types of cars.

Convertible Coupe Wagon Hatchback Pick up Limousine SUV Sedan

3. Find cars which fit the description.

Which car(s)…

1. have/ has lots of rooms for passengers?
2. is/are good for driving on bad roads?
3. is/are not suitable for large families?
4. is/are perfect for hot, sunny weather?
5. has/have low fuel consumption?
6. is/are ideal for small parking spaces?
7. has/have only one passenger seat?
8. is/are good for transporting things?

4. Read the descriptions of different types of cars. Are they true or false?Correct the false ones.

Mind: (BrE)estate car- (AmE)Station wagon
(BrE)saloon- (AmE)sedan
Off-road cars are also called four-by-fours.

1. The saloon car is a car that has a separate enclosed space for bags and cases.
2. The van car is a car with a roof which you can fold back or remove.
3. The hatchback car is a car with a door at the back that opens upward.
4. The limousine car is a vehicle made for travelling over rough ground.
5. The estate car is a car with a lot of space for boxes.
6. The off-road car is a big expensive car , usually driven by a chauffeur.
7. The convertible car is a vehicle used for carrying goods which is covered and has metal sides, and is smaller than a truck.

5. Match the words a-c with the pictures .

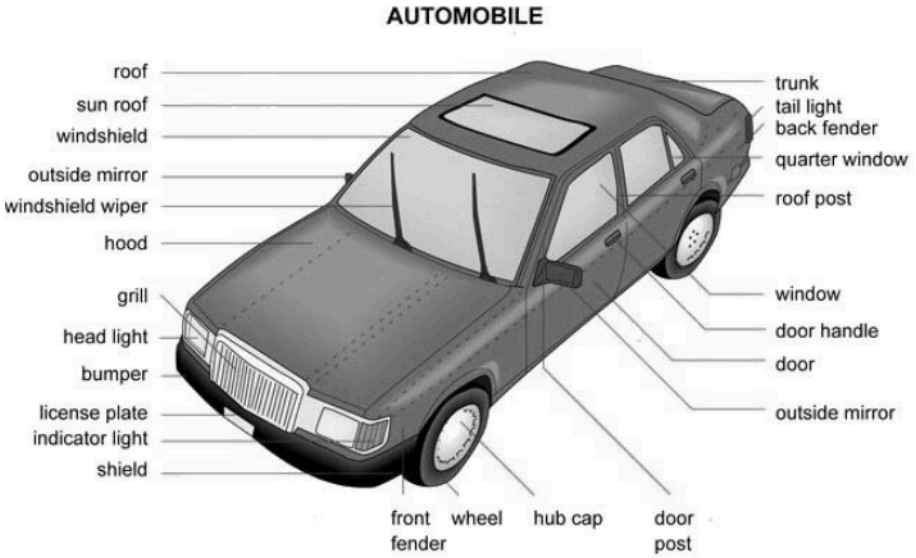
a) saloon b) estate c) hatchback d) convertible e) off-road f) sports car g) limousine

6. Read the dialogue and then practice the conversation in pairs.

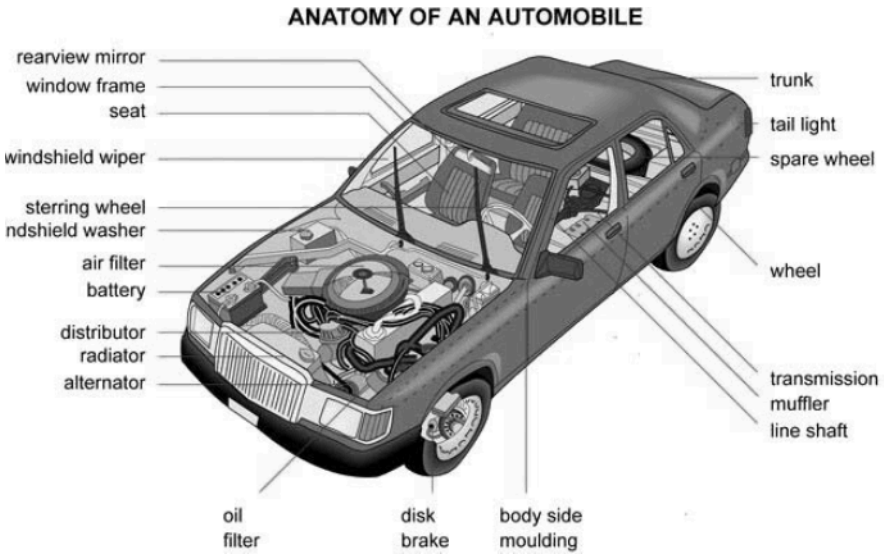
Car Salesman: Hello there!Howcan I help you?
Customer: Hi. I'm looking for a new car, one that my entire family can ride in.
Car Salesman: Well, I'm sure we have got something for you. How big is your family?
Customer: It's me, my four kids, and my husband.
Car Salesman: Big family! Do you all travel in the car?
Customer: We do. My parents live 3 hours away from us, and we often visit them.
Car Salesman: Hmm, you probably need some extra space for luggage, too.
Customer: We do. The kids pack a lot.
Car Salesman: Well, I think a minivan is the choice for you. Let me show you one.

III. Vocabulary practice

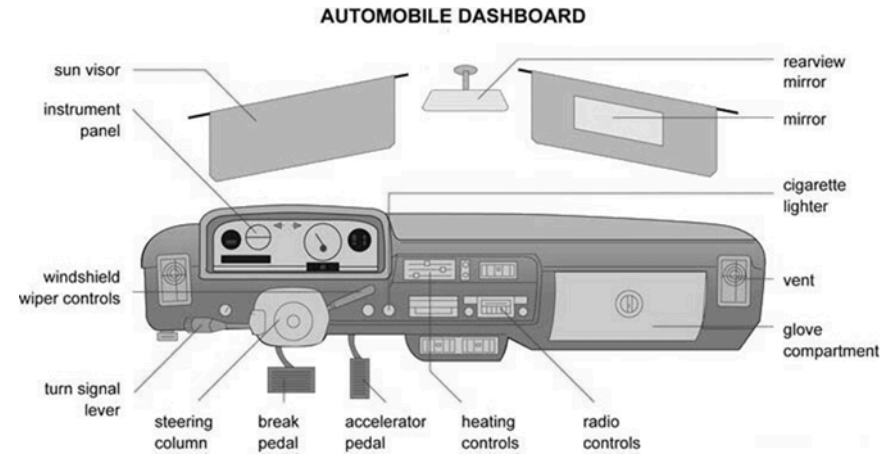
1. Look at the picture, read new words, guess the translation and write down them in your vocabularies.
Picture 1



Picture 2



Picture 3



2. Place the words and the phrases from the box under the correct headings.

Brake light, grill, taillight, fender, spoiler, headlight, hood, door, windshield, trunk, bumper, wheels.

Front of car	
Rear of car	
Side of car	

3. Read the sentences and choose the correct word.

1. Herman could not see the road because of the dirt on his **hood / windshield**.
2. Sylvie checked her **mirrors / taillights** to see if any cars were behind her.
3. Fortunately, only the front **bumper / spoiler**was damaged in the crash.
4. Louis used the **grill / wipers** to clear the snow from the windshield.

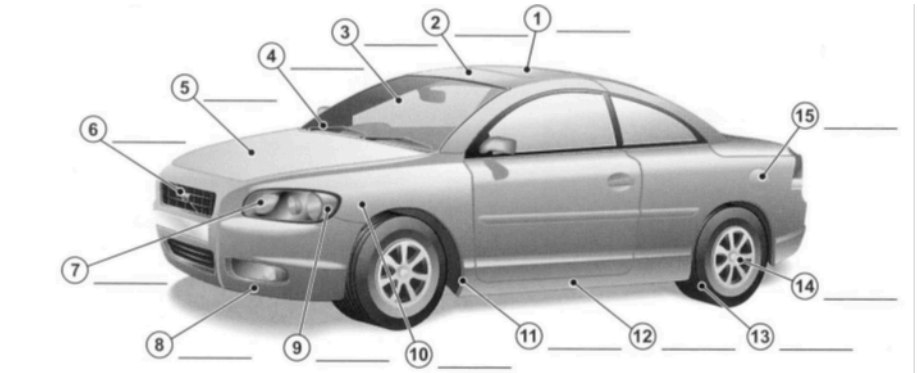
4.Read the conversation between two mechanics. Check (✔) the items that aredamaged. With a partner, act out the dialogue.

1 ☒ hood
2 ☒ fender
3 ☒windshield
4 ☒door
5 ☒wipers
6 ☒ lights

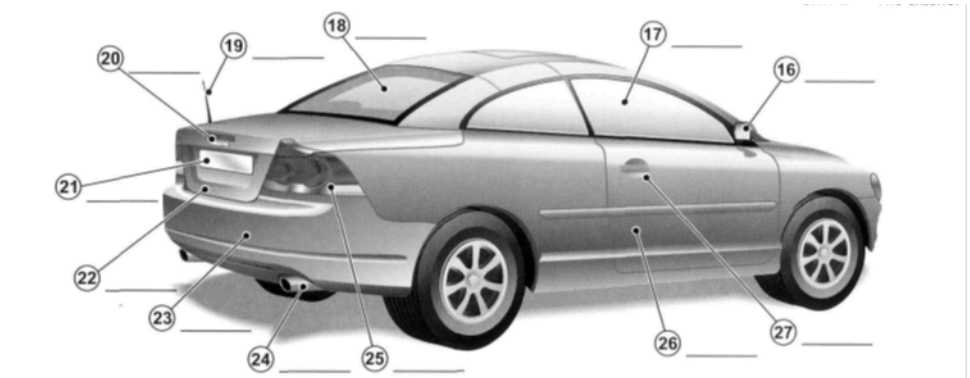
Mechanic 1: Do you have the checklist ready?
Mechanic 2: Yes, go ahead.
Mechanic 1: Okay, the hood and fenders are fine,
but there's a crack in the windshield.
Mechanic 2: Cracked windshield. Got it. Are the wipers ok ?
Mechanic 1: Yeah, they look fine.
Mechanic 2: Great. How are the lights?
Mechanic 1: They're all right, too. But I see a dent
in the passenger door.
Mechanic 2: Is there any damage to the paint?
Mechanic 1: Yes, it looks like some paint got scratched off.
Mechanic 2: Okay, scratched paint. Can you see anything else?
Mechanic 1:I think that's it.

IV. Use your English!

1. Label the parts of the car.



bonnet • front bumper • headlight • indicator • petrol cap or flap • roof • sill • sunroof • tyre • wheel arch • wheel trim • logo • windscreen • windscreen wiper • wing



aerial • badge • boot • door • door handle • exhaust pipe • number plate • rear bumper • rear window • wing mirror • side window • rear light

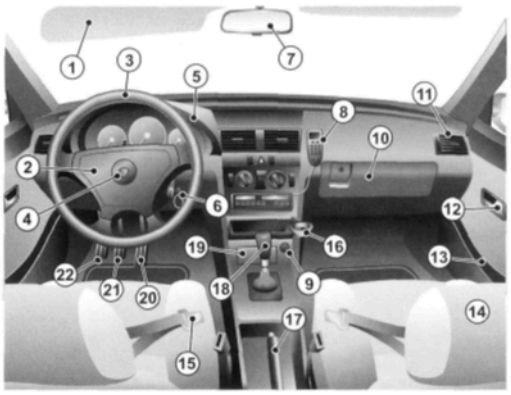
British English	American English
aerial	antenna
bonnet	hood
boot	trunk
indicator	turn signal
number plate	license plate
petrol cap or flap	gas tank lid
tyre	tire
windscreen	windshield
wing	fender

2. Complete the sentences with words from exercise 1.

Example :You open the bonnet to look to the engine.

1. The _____ absorb small impacts in the accident.
2. Don't forget to retract the _____before using the car wash.
3. can you put my suitcases in the _____,please?
4. When it starts raining , you need to switch on the _____.
5. «What model is that?» «I don't know , I can't see the _____ from here.»
6. It is important to inflate the _____ to the correct pressure for better fuel consumption.
7. The Mercedes star is a well-known _____.
8. Open the _____ and let some sun and fresh air into the car.
9. I wish all drivers would use their _____ when they want to turn right or left.

3. Label the parts of the car interior.



accelerator • air vent • airbag • ashtray • brake pedal • car seat (headrest) • cigarette lighter • clutch pedal • cup holder • dashboard • door handle • door tray • gearstick • glove compartment • handbrake • hands-free telephone • horn • ignition • rear-view mirror • seat belt • steering wheel • sun visor

1 _____	8 _____	15 _____
2 _____	9 _____	16 _____
3 _____	10 _____	17 _____
4 _____	11 _____	18 _____
5 _____	12 _____	19 _____
6 _____	13 _____	20 _____
7 _____	14 _____	21 _____
		22 _____

4. Complete the sentences with words from exercise 3.

1. It's so practical to have a _____ near the steering wheel. I can take a drink whenever I want.
2. In a car with manual transmission, you need to press the _____ when you want to change gear.
3. There is usually a cosmetic mirror on the passengers _____.
4. I have a leather _____ . It's not so cold for my hands in the winter and it gives you a good grip.
5. It's against the law to phone while driving so I've ordered a car with a _____.
6. Could you have a look on the road atlas? It's in the _____.
7. I don't need a _____ as I don't smoke and I don't want anyone to smoke in my car.
8. Could you close the _____? I'm getting a draught.

Additional exercises.

Exercise 1. Read and translate the text.

MOTORING IN ENGLAND

The motor-car has done so much to change our lives. Let us discuss cars, using the English names for the parts. We shall start inside the car.

Inside the car.

We talk about being in the front and in the back and we talk about the driver's seat and the passenger seats. This is all very easy. All round the car are windows, so that you can see out - except in front. This is called the windscreen, and the things which sweep rain off it are called windscreen wipers.

Driving the car.

When we drive the car we steer with the steering wheel. If there is someone in the way we stop the car with the brake - we brake the car - and sound the horn. When it is

clear to go again we accelerate to help us move off. Wehave a gear box. We change gear by pushing the gear lever from one gear to the next.

To help us to do this we have a foot pedal which is called the clutch. We put the clutch out to disengage the engine and we let the clutch in to make it drive again. Many cars have five gears: first (or bottom), second, third, top and reverse.

When we stop the car and want it to stay in one place we put on the handbrake.

To start the engine we switch on the ignition, press the starter, and the engine fires. We rev it up by pressing the accelerator pedal.

Sometimes in cold weather we need to use the choke to start the car. This gives us more petrol and less air -what is called a rion mixture. At night we switch on our lights, but in town or when someone is coming they must be dipped. To do this we operate the dip switch - sometimes this is a hand switch near the steering wheel, sometimes a foot pedal. And lastly to change direction we signal with our indicators. Those are "controls" of the car. With our hands we steer with the steering wheel, change gear with the gear lever, and put on the handbrake. We also use the indicators as they can dip the lights. With our feet we accelerate by using the accelerator, stop by using the foot brake, change gear by using the clutch, and we can have a pedal dip switch. And that is about all inside the car - except, of course, the mirror for seeing what is happening behind, the sun visors to shield our eyes against low sunshine, and, in England where they are compulsory, seat belts.

Exercise 2. Find proper endings.

1. When we drive the car we steer with...
a) the wipers; b) the steering wheel; c) the final drive.
2. If there is someone in the way we stop the car with...
a) the brake; b) the horn; c) the clutch.
3. We have a foot pedal which is called...
a) the cycles; b) the spring; c) the clutch.
4. Many cars have five...
a) gears; b) strokes; c) axles.
5. To change direction we signal with our...
a) pedals; b) indicators; c) handbrakes.

Unit 4. Internal Combustion Engine

I. Pre-reading exercises.

1.Read and remember the following words.

an internal combustion engine - двигун внутрішнього згорання
tocompress - стискати
toignite - підпалювати
fuel - топливо
air -повітря
togenerate - виробляти
cylinder - циліндр
engineblock - блок двигуна
piston - поршень
to move up and down- рухатися вниз і вгору
to pull |- тягнути
pistonring- поршневе кільце
sparkplug- свіча запалювання
fuelmixture- паливна суміш
explosion - вибух
upward - рух угору
downward - рух униз
connecting rod- шатун
mechanicalenergy- механічна енергія
crankshaft - колінчатий вал
crankcase -картер
valve - клапан

II. Reading.

1. Read and translate the text.

INTERNAL COMBUSTION ENGINE

An internal combustion engine operates in a cycle that compresses and ignites fuel and air to generate energy. The starting point is the cylinder. The cylinder runs through the head and down into the engine block. A piston within the cylinder moves up and down. At the start of the cycle, it pulls a mixture of fuel and air through valves and into the cylinder. It then moves upward compressing the fuel mixture. A piston ring forms a tight seal between the piston and the cylinder wall. This ensures that the fuel mixture cannot escape. It also keeps oil from the sump from entering the combustion chamber. Next, a spark plug fires and ignites the fuel mixture. The resulting explosion pushes the piston downward. This in turn moves a connecting rod attached to the piston. The connecting rod transfers the mechanical energy from the piston to a crankshaft contained within a crankcase.

2.Read the encyclopedia entryagain. Then, mark the following statements as true (T) orfalse (F).

1. Air enters the cylinder through the valves.
2. Fuel is compressed by the piston.
3. The crankshaft connects to the sparkplug.

3. Match the words (1-6) with the definitions (A-F).

1 _ engine block
2 _ connecting rod
3 _ crankcase
4 _ piston ring
5 _ spark plug
6 _head

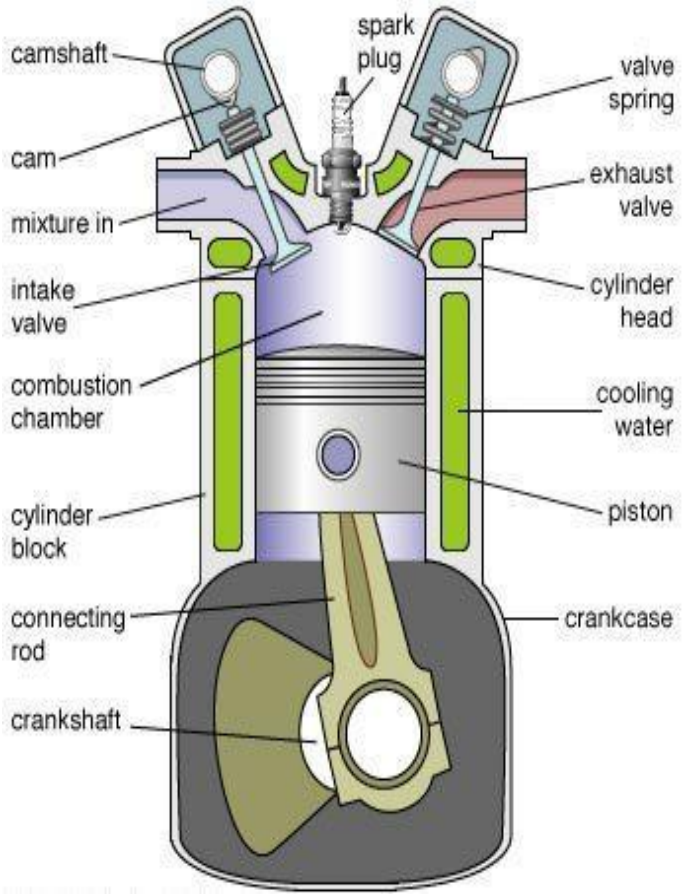
A body of engine
B holds large shaft in engine
C creates tight seal
D top part of engine
E transfers power from piston
F causes explosion

4. Fill in the blanks with the correct words from the word bank.

piston	cylinder	sump	crankshaft	valve

1 A _____ controls the flow of air into an engine.
2 The holds the engine's supply of oil.
3 The spark plug fires in the _____ .
4 The moves up and down in a cycle.
5 The connecting rod powers the _____ .

5. Look at the picture 4, show and name the main parts of the engine.



Picture 4.

6.Find proper Ukrainian equivalents of the English words.

1.connecting rod 2.combustion chamber 3.piston 4.spark plug 5.crankshaft 6. cylinder head 7. camshaft 8. crankcase 9.fuel 9. cylinder block 10. intake valve 11. exhaust valve	a) картер b) блок циліндрів c) головка циліндра d) камера згорання e) випускний клапан f) топливо g) впускний клапан h) поршень i) шатун j) розподільний вал k) свіча запалювання l) колінчастий вал

II. Use your English.

1. Look at this extract from a tour of a car factory. Complete the text with words from the box.

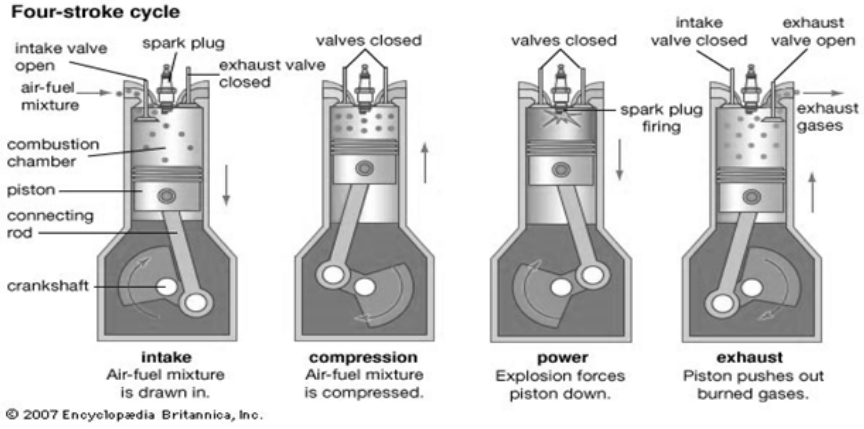
clutch combustion crankshaft cylinders distribution fuel piston sparkplug torque

“ Now we come to the engine. The principle of the internal _____ engine has not changed in the last 100 years. The engine takes in _____ and air which is compressed in a combustion chamber. Then this mixture is ignited by a _____ to produce an explosion, which moves the _____ in the cylinder. The up and down motion of the piston in the cylinder is converted into rotational motion by the _____. The rotational force generated by the engine is known as _____. The size of the engine determines the power. The more _____ there are, the more powerful the engine. This power is transmitted through the _____, the gearbox, the propeller-shaft (in rear-wheel and four-wheel drive), and the axels to the wheels. The position of the engine can vary, but generally speaking it is mounted at the front. In some sports cars , the engine is mounted at the rear (e.g. Porsche) or in the middle (e. g. Ferrari or Lamborghini) because of weight _____. So, that’s enough about the engine for the moment, let’s move to the next stage…”

2. Read the text.

Principle of Operation of the Four-Stroke Petrol Engine

The internal combustion engine is called so because fuel is burned directly inside the engine itself. Most automobile engines work on a 4-stroke cycle. A cycle is one complete sequence of 4 strokes of the piston in the cylinder. The operating cycle of the four-stroke petrol engine includes: inlet stroke (intake valve opens), compression stroke (both valves closed), power stroke (both valves closed), exhaust stroke (exhaust valve is opened).



To describe the complete cycle, let's assume that the piston is at the top of the stroke (top dead center) and the inlet and the exhaust valves are closed. When the piston moves down the inlet valve opens to intake a charge of fuel into the cylinder. This is called the inlet (intake) stroke. On reaching the lowest position (bottom dead center) the piston begins to move upward into the closed upper part on the cylinder, (he inlet valve is closed and the mixture is compressed by the rising piston. This is called the compression stroke. As the piston again reaches the top dead center the spark plugs ignite the mixture, both valves being closed during its combustion. As a result of burning mixtures the both valves being closed during its combustion. As a result of burning mixtures the gases expand and

great pressure makes the piston move back down the cylinder. This stroke is called the power stroke. When the piston reaches the bottom of its stroke, the exhaust valve is opened, pressure is released, and the piston again rises. It lets the burnt gas flow through the exhaust valve into the atmosphere. This is called the exhaust stroke which completes the cycle. So the piston moves in the cylinder down (intake stroke), up (compression stroke), down (power stroke), up (exhaust stroke).

The heat released by the fuel is transformed into work so that the reciprocating movement of the pistons is converted into rotary movement of a crankshaft by means of connecting rods.

Picture 5. Principle of Operation of the Four-Stroke Petrol Engine

3. Answer the questions:

1. Why is the engine called the internal combustion engine?
2. What stroke is called the inlet one?
3. What is a compression stroke?
4. What takes place in the cylinder on power stroke?
5. What takes place on the exhaust stroke?
6. By means of what is the reciprocating movement of the pistons converted into rotary movement of a crankshaft?

1.

It is called so because the fuel (the mixture) is burned…

a)directly inside the engine;
b)outside the engine.

2. The inlet stroke is called so because during moving down the piston…
   a) the inlet valve opens to intake a charge of fuel into the cylinder;
   b)the inlet valve is closed and the mixture is compressed.
3. The compression stroke is a stroke
   a) when the inlet valve opens to intake a charge of fuel into the cylinder;
   b) when the inlet valve is closed and the mixture is compressed.
4. On power stroke
   a)the spark plugs ignite the mixture, both valves are closed during its combustion;
   b)the exhaust valve is opened and the residual gas flows through the exhaust valve into the atmosphere.
5. On the exhaust stroke
   a)the spark plugs ignite the mixture, both valves are closed during its combustion;
   b)the exhaust valve is opened and the residual gas flows through the exhaust valve into the atmosphere.
6. It is done
   a)by means of pistons;
   b)by means of the connecting rods.

4. Find the proper ending.

1. The internal combustion engine is called so because fuel is burned…

a)outside the engine;
b)inside the engine.

2. On the inlet stroke

a)the intake valve opens;
b)the intake valve is closed;
c)the intake and the exhaust valves are closed.

2. On the compression stroke

a). the intake valve opens;
b).the intake valve is closed;
c).the intake and the exhaust valves are closed.

3. On the power stroke

a).the intake valve opens;
b)the intake valve is closed;
c)the intake and the exhaust valves are closed.

4. On the exhaust stroke

a).the exhaust valve opens;
b).the intake valve is closed;
c).the intake and the exhaust valves are closed.

4. Read the dialogue and then practice the conversation in pairs.

Tracing a Fault

Nick: Peter, I know you are a good driver. I would like you to have a look at my car.
Peter: What's wrong with your car?
N.: I don't know.
P.: Let me have a look. When did you have your plugs checked?
N.: Three days ago. I thought I had run out of fuel but the tank is half full.
P.: The carburettor is in order but the engine is misfiring. I guess the battery has run down. It needs recharging.
N.: Too bad.
P.: Don't get upset about it. It won't take you long to have your battery recharged.
N.: Do you really think so?
P.: I am sure of it. I advise you to have the engine greased.
N.: I'll follow your advice. Thank you, Peter.
P.: Don't mention it, Nick. I'm very sorry I couldn't help you.
N.: Well, you helped me to find the fault. Thanks a lot. Good-bye.

P.: See you later.

At the Repairing Shop

Client: Good afternoon! Can you help me? There is something wrong with the engine.
Master: Hi! What is wrong with it?
C.: I don't know. It wouldn't start. Maybe the pistons and valves are in disorder.
M.: Let's have a look! Well, they are quite right.
C.: And what about the crankshaft, or electric spark plugs. I know absolutely nothing about the operating cycle of the engine.
Just a moment. Don't worry! We shall check up all units and how they work together.
Some time later
M.: My God! There is no petrol in the tank. How can you move drive?
C.: Really? Oh, I have forgotten to fill in the tank! I beg your pardon to trouble you!
M.: No trouble, at all. You are welcome!

Unit 5. Diesel Engine VS Petrol Engine.

I. Pre-reading exercises.

1. Remember the following words and word-combinations.

maintenance-технічне обслуговування

combustion chamber-камера згорання

dieselinjectionpump-дизельний насос живлення

heat up-підпалювати

toforce-змущувати

glowplug-свічка розжарювання

toincreaseefficiency-підвищувати ефективність

compressionratio- коефіцієнт стиснення

polluting-забруднюючий

biodiesel-біодизель

sustainablefueloption-стійкий варіант палива

durable-довговічний

2. Before you read the passage, answer these questions.

1. What are some different types of fuel for vehicles?
2. In what part of an engine does fuel ignite?

II. Reading.

Exercise 1. Read the text.

ASK MECHANIC

Dear Mechanic, I want to buy my first car. I noticed that some engines run on gasoline and others run on diesel. What's the difference?

- Todd in Yarmouth

Dear Todd, Both types of engines have combustion chambers. However, a diesel engine doesn't have a spark plug. Instead, it uses hot, compressed air to ignite the fuel. The air enters the chamber first. Then he fuel injection pump forces fuel into the chamber. Some have precombustion chambers or glow plugs that heat up the air to increase efficiency. In gasoline engines, on the other hand, fuel and air are mixed before entering the chamber, though most use a fuel injection pump as well. Diesel engines also have a higher compression ratio.

Diesel has a bad reputation because it doesn't burn as clean as gasoline. New clean diesel is much less polluting. And biodiesel offers a sustainable fuel option. It's more expensive than gasoline, but provides better fuel economy. Another thing to remember: diesel engines require less maintenance and are more durable.

Exercise 2.Find out these word-combinations in the text.

Працювати на бензині, працювати на дизельному паливі, він використовує тепло, підпалювати паливо, заходити в камеру, насос живлення, передкамерне горіння, свічки розжарювання, збільшувати ефективність, насос уприскування палива, високий коефіцієнт стиснення, менше забруднюючий, забезпечувати кращу економію палива, потребувати менше догляду, довговічний.

Exercise 3. Read the passage, then choose the correct answer.

1. What is the purpose of the column?
A. to show ways to use less fuel
B. to state the benefits of diesel fuel
C. to explain the process of combustion
D. to compare different types of engines
2. How is a gasoline engine different from a diesel engine?
A. A gas engine releases more pollutants.
B. A gas engine uses spark plugs for ignition.
C. A gas engine needs more time to warm up.
D. A gas engine has a smaller fuel injection pump.
3. Which of the following is NOT a feature of a diesel engine?
A. Air and fuel mix before entering the chamber.
B. It is more durable than a gasoline engine.
C. It doesn't burn as clean a gasoline engine.
D. Gasoline cannot be used in it.

Exercise 4. Read the sentence pair. Choose where the words best fit the blanks.

1. clean diesel / biodiesel

A. Plants are a main source for ____ .
B. _____ was created because regular diesel had too many pollutants.

2. heat up / run on

A. When you start engines they ____ .
B. Most cars today _____ gasoline.

3. durable/ maintenance

A. All vehicles require some ____ .
B. A _____ engine will last a long time.

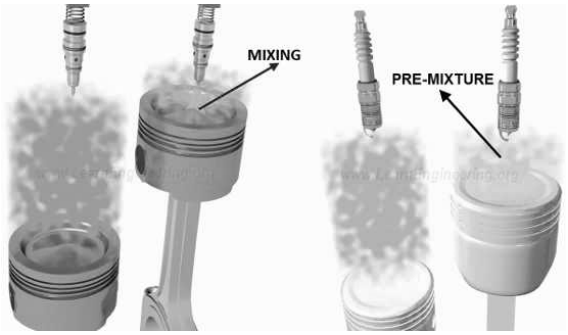
4. gasoline / diesel

A._____ engines do not use spark plugs.
B._____ engines are the most common today.

Exercise 5. Read and translate the text.

Comparison of diesel and petrol engines

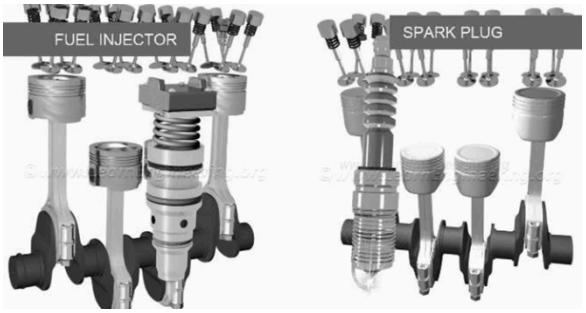
The following generalization may be made on the use of diesel versus petrol engines in commercial vehicles and, more recently, cars:



1. The diesel engine has better fuel economy than the petrol engine. This is because its thermal efficiency is 30-36 per cent, compared with the 22-25 per cent of a petrol engine. Thermal efficiency is the ratio of useful work performed by the engine to the internal energy it receives from its fuel.

2. The diesel engine has generally proved to be more reliable, to need less maintenance and also to have a longer life than an equivalent petrol engine. These advantages derive mainly from its sturdier construction and cooler running characteristics.

3. Although a petrol engine develops its maximum power at higher rotational speeds than an equivalent diesel engine, the latter can provide better pulling power. This is because the maximum turning effort or torque exerted by the crankshaft of the diesel engine is greater and also better maintained over a wider range of engine speeds.



4. A disadvantage of the diesel engine is that it tends to be heavy and bulky in relation to its power output. This is explained by the greater operating pressures and loads that have to be catered in the construction of the diesel engine.

5. The noise and vibration level of the diesel engine, especially under idling and low speeds operation, compares unfavourably with the petrol engine. Again, this is chiefly a function of the much higher cylinder pressures in the diesel engine. More recent diesel-engined motor cars have nevertheless been praised for their low level of noise at motorway cruising speeds.

6. The diesel engine is sometimes criticized for having smoky exhaust of unpleasant odour, although it is the invisible products of combustion in the exhaust gases of a petrol engine that are more harmful to the environment.

7. A safety consideration is that the fuel oil used in motor vehicle diesel engines is far less dangerously flammable than petrol, thus reducing fire risk in the event of an accident. Finally, the basic cost of the diesel engine, to-gether with its associated fuel injection equipment, is generally higher than that of an equivalent petrol engine.

Exercise 6.Find out these word-combinations in the text.

Іскрове запалювання, частковийвакуум, істотнавідмінність, попорівнянню, нахолостомуходу, забезпечитисамозайманнязарядупалива, поршеньщопідіймаєтьсяіопускається, чотирьохтактнийдизельнийдвигун, впускнийівипускнийклапани, набагатоменшвогнебезпечний, щкідливийдлянавколишньогосередовища.

Exercise 7. Guess wether these statemens true or false.

1. Fuel charge and air are taken into the combustion chamber together. 2. Thermal efficiency of a diesel engine is higher than that of a petrol engine. 3. A diesel engine operates on spark ignition. 4. With a diesel engine there is less fire risk in the event of an accident.

Exercise 8..Chose the proper endings.

1. During the induction stroke the depression is created by... a) advancing piston. b) powerful pump. c) retreating piston. d) the valves.

2. The maximum torque exerted by the crankshaft of a diesel engine is... a) less than that of a petrol engine. b) greater than that of a petrol engine. c) equal to that of a petrol engine.

3. The diesel engine is sometimes criticized for... a) less reliability. b) having smoky exhaust. c) large amount of consumpted fuel. d) its ignition equipment.

4. Thermal efficiency is... a) the amount of fuel it takes. b) temperature reached in its cylinders. c) the ratio of useful work performed by the engine to the internal en-ergy it receives from its fuel.

Exercise 9. Define the proper sequence of the strokes

1. The power stroke
2. The compression stroke
3. The exhaust stroke
4. The induction stroke

Unit 6. Engine Systems.

I. Pre-reading exercises.

1. Remember the following words and word-combinations.

bearing[ˈbɛərɪŋ] підшипник
cause[kɔːz] причина
control [kənˈtrəʊ] контролювати
cool [kuːl] охолоджувати
coolant [ˈkuːlən]охолоджуюча рідина
deliver [dɪˈlɪvə] постачати
equip [ɪˈkwɪp]споряджати, викликати
expand[ɪksˈpænd]розширюватися
fan [fæn] вентилятор
film [fɪlm] плівка
float[fləʊt]плавати
force [fɔːs] сила
friction [frɪkʃn] тертя
gear [gɪə] шестерня, привід , передача
governor [ˈgʌvənə]регулятор
injector [ɪnˈʤektə]форсунка, інжектор
inlet [ˈɪnlet] впукний
idle [aɪdl] працювати на холостому ході
locate [ləʊˈkeɪt] розміщувати
lubricate [luːbrɪkeɪ] змащувати
manifold [ˈmænɪfəʊld] патрубок
oilpanмасляний піддон
passage [pæsɪʤ]прохід
pressure [ˈpreʃə] тиск
proper [ˈprɔpə]належний
ratio [ˈreɪʃɪəʊ] відношення
reduce [rɪˈdjuːs] зменшувати
rise [raɪz] підвищувати
surface [sɜːfɪs]поверхня
vary [ˈvɛərɪ] розрізняються
waterjacket водяна рубашка
wear [wɛə] зношуватися

Vocabulary practice

Excersice 1.

Match Englishwords with their Ukrainian equivalents.

1.manifold 2. pressure 3. reduce 4. wear 5. surface 6.oil pan 7. locate 8. governor 9. expand 10. equip 11. coolant 12. bearing 13. injector 13. film 14.vary 15.deliver	a) Форсунка b) Поверхня c) Охолоджуюча рідина d) Розширюватися e) Постачати f) Патрубок g) Підшипник h) Тиск i) Плівка j) Масляний піддон k) Зменшувати l) Розрізнятися m) Зношуватися n) Обладнувати o) Розміщувати p) Регулятор

II. Reading.

1. Read the text.

THE SYSTEMS OF THE INTERNAL COMBUSTION ENGINE

Four systems are necessary for proper operation of the Internal combustion engine. These are fuel, lubricating, cooling and ignition systems.

The Fuel System. The gasoline engine fuel system must supply the engine with a mixture of air and fuel that burns within the cylinders. Gasoline engines use a carburettor mixing the fuel and air and delivering the mixture to the engine through the intake manifold. Air-fuel rations vary for idling light-load and heavy-load operations. Diesel engines have a high-pressure pump forcing the fuel through injectors into the combustion chamber.

The Lubricating System. A film of oil is produced between the working surfaces of the metal parts. In this way friction and wear are being reduced because the film of oil keeps the surfaces apart. A lubricating systemis necessary in order to deliver the oil to the moving parts of the engine. All modern tractor engines are lubricated by the force-feed method. Engine lubrication is provided by an oil pump located in the oil pan. Gear-type pumps are commonly used in most engines because of their long life and trouble-free operation. Pump inlets are located in a float that takes oil from the cleanest place in the oil pan. Oil filters are located between the oil pump and engine parts to reduce engine wear. Oil is delivered through passages to the camshaft bearings, the crankshaft main bearings and the connecting rod bearings. Oil is delivered to the valve mechanism and other parts requiring lubrication.

The Cooling System. There are two types of the cooling system: the thermosiphon system and the pump system. In the thermosiphon system the water expands as it is being

heated and rises to the top of the radiator. Gravity causes ,the downward movement of the water in the radiator where cooling takes place. Then the water is delivered back to the engine water jackets: the engine parts are being cooled.

The Ignition System. In gasoline engines the fuel charge is ignited by an electric spark. These are spark ignition engines. In diesel engines the compressed air ignites the fuel charge. Diesels are compression ignition engines.

Spark ignition engines use an electric ignition system providing the ignition of the fuel charge.

Two types of electric ignition systems are commonly used: the battery system and the magneto system. These systems function on the same basic principles. Battery systems are used on practically all newer tractors.

III. **Post-reading exercises**

Exercise1.. For each statement say whether it is true or false. If false say why it is false?

1. Five systems are necessary for proper operation of the Internal combustion engine.
2. The gasoline engine fuel system must supply the engine with a mixture of air and fuel that burns within the cylinders.
3. A film of oil is produced between the working surfaces of the metal parts.
4. Friction and wear are being increased because the film of oil keeps the surfaces apart.
5. There are four types of the cooling system.
6. Gravity causes ,the downward movement of the water in the radiator where heating takes place.
7. In diesel engines the fuel charge is ignited by an electric spark.
8. There are two types of electric ignition systems that are commonly used.
9. In the thermosiphon system the water expands as it is being cooled and rises to the top of the radiator.
10. Pump inlets are located in a float that takes oil from the furthest place in the oil pan.

Exercise 3.Find the English equivalents in the text

Дляналежного функціонування, забезпечити двигун сумішшю палива і повітря, доставляти суміш, між робочими поверхнями металевих деталей, тертя та зношення зменшуються, знаходитися в поплавковій камері, система охолодження, поширюватися, сила тяжіння, кожух водяного охолодження, двигун із запаленням від стиснення, двигун з іскровим запаленням.

Exercise 3. Answer the questions.

1. How many systems are necessary for proper operation of the internal combustion engine? 2. What are those systems? 3. What system must supply the engine with a mixture of air and fuel? 4. Where does the mixture of air and fuel burn? 5. What pump do the

diesel engines have? 6. Where is a film of oil produced? 7. What system is necessary in order to deliver the oil to the moving parts of the engine? 8. By what method are all modern tractor engines lubricated? 9. What pumps are commonly used in most engines? 10. Where are pump inlets located?11. Where is oil delivered to? 12. How many types of cooling system are there? 13. What causes the downward movement of the water in the radiator? 14. What system is providing pressure for circulation? 15. In what engines is the fuel charge ignited by an electric spark? 16. What ignites the fuel charge in diesel engines? 17. What ignition system do spark ignition engines use?18. What types of electric ignition systems are commonly used?

Exercise 4. Retell the text using scheme suggested below.

1.__ are necessary_ _ _ _.
2. _ are _, _ .
3. _ must supply_ _,_,with _.
4. _ burns within _.
5. _ have _ _.
6. _ is produced between _ _ _ _ .
7. _ is necessary in order to_ _ _ _ _.
8. _ are lubricated by _ _ .
9. _ are commonly used _ _ .
10. _ are located _ _ .
11. _ can see _ _ _ .
12. _ is delivered to _ _ , _ _ _ , and_ _ _ .
13. There are _ _ _ _.
14. _ causes _ _ _ .
15. _ is providing _ _ .
16. _ is ignited by_ _ .
17. _ ignited _ _ _ _.
18. _ use _ _ _.
19. _ are commonly used : _ _ and_ _ .

Unit 7. Types of Fuels.

I. Pre-reading exercises.

1. Remember the following words:

vehicles-транспортні засоби
to run on- працювати
to be aware of- бути обізнаним, знати
vast- великий, велика
fossil fuels- горючі корисні копалини
quick- швидкий
acceleration- прискорюватися, розганятися
hydrocarbons- вуглеводний
contribute-сприяти, вносити
pollution- забруднення
smog- смог
global warming- глобальне потепління
readily- відразу, легко
nitrous-азотистий
liquefiedpetroleum-зріджений газ
propane-пропан
odorless- без запаху
non-corrosive-неагресивний
sugarcane-цукрова тростина
barley- ячмінь
rapeseeds-рапс

II. Reading.

1. Read the text.

Six Types of Fuels Used in Today's Vehicles

Today's vehicles run on a variety of fuels, some of which you probably aren't aware of. While it's true than the vast majority of vehicles run on gasoline, the technology to burn other fuels to meet our transportation needs does exist, with specific advantages and disadvantages for each.

Gasoline

Gasoline or petrol is the most common fuel used in cars today. This specialized fossil fuel is designed for four-stroke engines like the ones found in common cars. Gasoline allows for quick starting, fast acceleration, easy combustion and quiet operation.

The hydrocarbons contained in gasoline and its production of carbon dioxide when burned contributes to pollution, smog and global warming. Although it is the most readily available fuel, it is considered to be a temporary source of fuel because of its cost, environmental effects and limited resources.

Diesel

Diesel fuel is widely used in transport vehicles such as tractor-trailer trucks, buses, boats and trains. This fossil fuel is also non-renewable, like gasoline. Although it contributes less carbon dioxide to the environment, diesel creates more organic compounds and nitrous oxide that cause smog.

Diesel vehicles tend to last longer than gasoline vehicles, and they have 30 percent better fuel efficiency than the average gasoline vehicle, according to the Petrol Prices website.

Liquefied Petroleum

Liquefied petroleum, better known as propane, is a clean fuel alternative to gasoline that is used in common vehicles on a limited basis. You'll find hybrid cars in the United Kingdom that have been designed to use propane, but generally the only way to get a propane vehicle in the United States is to have a gas engine converted.

Liquefied petroleum produces fewer toxins when burned and does not contribute to smog in the same way that diesel and gasoline do. Propane is also less expensive than gasoline.

Compressed Natural Gas

Gas and diesel engines can be converted to run on compressed natural gas, or CNG. CNG is a clear, odorless and non-corrosive gas that can be used in liquid or gas form to run a combustion engine.

Vehicles fitted with a CNG fuel system can be expected to produce 80 percent less ozone-forming emissions than gasoline burning cars, according to the Consumer Energy Center website. CNG filling stations are in place is select areas in the country, primarily in California.

Ethanol

Ethanol is a bio-fuel alternative to gasoline that's made from the conversion of sugar cane, corn, barley and other natural products. Ethanol has become popular as a fuel source because in most cases it's one of the only fuels that can fuel a gasoline engine without modifications. Many car models can run on 100 percent ethanol, but it is more commonly used as an additive.

Bio-diesel

Bio-diesel is a diesel substitute made from sugar beet, rapeseed or palm oil. Individuals sometimes make this substance by collecting used oil from restaurant fryers.

Bio-diesel burns much cleaner than standard gas or diesel and produces far less carbon dioxide emissions when used. However, continued production of this substance may result in excessive deforestation.

III. **Post-reading exercises**

Exercise 1. Find proper endings in the text.

1. Gasoline or petrol is… 2. The hydrocarbons contained… 3. Diesel fuel is widely used in … 4. Although it contributes less… 5. Liquefied petroleum, better known as propane, is

… 6. Liquefied petroleum produces … 7. Gas and diesel engines can be converted … 8. Vehicles fitted with a CNG … 9. Ethanol is a bio-fuel alternative … 10. Bio-diesel is a diesel substitute made …

Exercise 2.Mark the following statements as true (T) orfalse (F).

1. Liquefied petroleum, better known as diesel, is a clean fuel alternative to gasoline that is used in common vehicles on a limited basis.
2. Bio-diesel is a diesel substitute made from sugar beet, rapeseed or palm oil.
3. Gasoline or petrol is the most common fuel used in cars many years ago.
4. This specialized fossil fuel is designed for two-stroke engines like the ones found in common cars.
5. Gasoline allows for quick starting, fast acceleration, easy combustion and quiet operation.
6. Diesel fuel is widely used in transport vehicles such as tractor-trailer trucks, buses, boats and trains.
7. This fossil fuel is also renewable, like gasoline.
8. Liquefied petroleum, better known as propane, is a clean fuel alternative to gasoline that is used in common vehicles on a limited basis.
9. Liquefied petroleum produces lots of toxins when burned.
10. Ethanol is a bio-fuel alternative to gasoline that's made from the conversion of sugar cane, corn, barley and other natural products.

Exercise 3.Write down the summary.

The theme under consideration is_____. There are different kinds of fuels. There are _____. Gasoline is the most _____. Gasoline allows for quick starting _____. Diesel fuel is widely used in transport vehicles such _____. Liquefied petroleum is a clean fuel _____. Biodiesel is a diesel substitute made for_____.

Exercise 4.Answer the following questions

1. How many types of fuel are used in today’s vehicles?
2. What is the most common fuel used in cars today?
3. Why is fuel considered to be a temporary source of fuel?
4. Do diesel vehicles tend to last longer than gasoline vehicles?
5. What is the only way to get a propane vehicle?
6. What is more expensive propane or gasoline?
7. What does the abbreviation CNG mean?
8. What type of fuel is one of the only fuels that can fuel a gasoline engine without modifications?
9. From what plants is biodiesel made from?

Exercise 5. Find the proper ending

1. Gasoline 2. Ethanol 3. Diesel 4. Bio-diesel 5. Compressed natural gas 6. Liquefied Petroleum	**a)** Is a bio-fuelalternative to gasoline that's made from the conversion of sugar cane, corn, barley and other natural products. **b)** is a diesel substitute made from sugar beet, rapeseed or palm oil. **c)** is widely used in transport vehicles such as tractor-trailer trucks, buses, boats and trains allows for quick starting, fast acceleration, easy combustion and quiet operation. **d)** is widely used in transport vehicles such as tractor-trailer trucks, buses, boats and trains **e)** is a clean fuel alternative to gasoline that is used in common vehicles on a limited basis. **f)** is a clear, odorless and non-corrosive gas.

Exercise 6.Look through the text and fill in the table

	Advantages	**Disadvantages**
Diesel		
Gasoline		
Ethanol		

Biodiesel		
Compressed Natural Gas		
Liquefied Petroleum		

Supplementary tasks.
Translate the text.

Advantages of Biodiesel

- Produced from Renewable Resources: Biodiesel is a renewable energy source unlike other petroleum products that will vanish in years to come. Since it is made from animal and vegetable fat, it can be produced on demand and also causes less pollution than petroleum diesel.
- Can be Used in existing Diesel Engines: One of the main advantage of using biodiesel is that can be used in existing diesel engines with little or no modifications at all and can replace fossil fuels to become the most preferred primary transport energy source. Biodiesel can be used in 100% (B100) or in blends with petroleum diesel. For e.g.: B20 is called as 20% blend of biodiesel with 80% diesel fuel. It improves engine lubrication and increases engine life since it is virtually sulphur free.
- Less Greenhouse Gas Emissions (e.g., B20 reduces CO_2 by 15%): Fossil fuels when burnt release greenhouse gases like carbon dioxide in the atmosphere that raises the temperature and causes global warming. To protect the environment from further heating up, many people have adopted the use of biofuels. Experts believe that using biodiesel instead of petroleum diesel can reduce greenhouse gases up to 78%.
- Grown, Produced and Distributed Locally: Fossil fuels are limited and may not be able to fulfill our demand for coal, oil and natural gas after a certain period. Biodiesel can work as an alternative form of fuel and can reduce our dependence on foreign suppliers of oil as it is produced from domestic energy crops. It is produced

in local refineries which reduce the need to import expensive finished product from other countries.

- Cleaner Biofuel Refineries: When oil is extracted from underground, it has to be refined to run diesel engines. You can't use it straight away in the crude form. When it is refined, it releases many chemical compounds including benzene and butadiene in the environment which are harmful for animals, plants and human life. Biofuel refineries, which mainly uses vegetable and animal fat into biofuel releases less toxic chemicals, if spilled or released to the environment.
- Better Fuel Economy: Vehicles that run on biodiesel achieve 30% fuel economy than petroleum based diesel engines which means it makes fewer trips to gas stations and run more miles per gallon.

Unit 8. Clutch

I. Pre-reading exercises.

1. Remember the following words and word-combinations.

friction device — фрикційний пристрій
connect — з'єднувати
gearbox — коробка передач
startthecar - завести автомобіль
release the engine- від'єднати двигун
pressure disc — натискний диск
hard-wearing material- зносостійкий матеріал
frictional force – сила тертя
clutchpedal —педаль щеплення
atrest —в спокої
isengaged- увімкнено
fix- кріпити
flywheel- маховик
is disengaged- відключено
frictiondisc (plate)- диск тертя
runidly- працювати вхолосту

II. Reading.

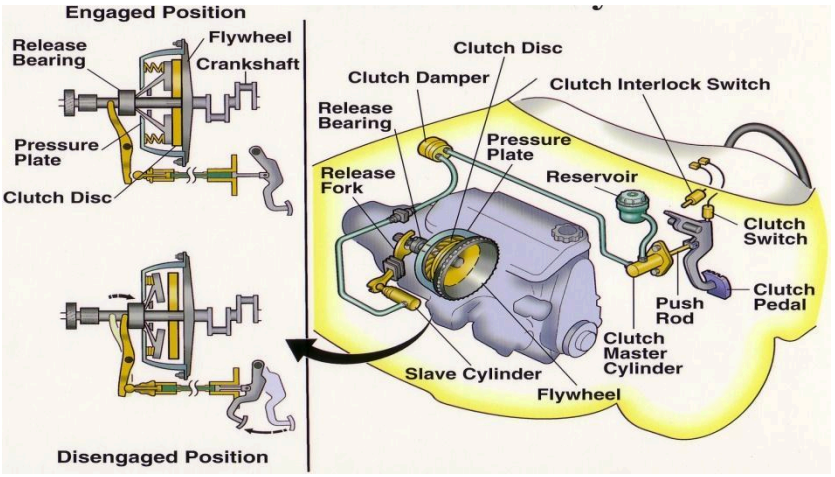
1. Read the text.

TEXT
Clutch

The clutch is a friction device. It connects the engine to the gears in the gearbox. It is used for disconnecting the engine from the gearbox, for starting the car and for releasing the engine from the car wheels.

The clutch is fixed between the flywheel of the engine and the gearbox und consists of two plates (discs): the friction disc and the pressure disc. The friction disc is situated between the flywheel and the pressure plate and has a hard-wearing material on each side.

The basic principal operation of the clutch is a frictional force acting between two discs. The clutch is controlled by the clutch pedal. When the pedal is at rest the clutch is engaged and the running engine is connected to the gearbox. When the pedal is pressed down the clutch is disengaged and the engine runs idly.



Picture 6.

Exercise 1.Find out these word-combinations in the text and write down their Ukrainian equivalents.

Friction device, clutch, gearbox, to free, to start, to release, flywheel, pressure plate, basic principle of operation, to fix, hard-wearing material, to consist of, to be controlled by, running engine, to run idly, to engage, to disengage, to press down, to be at rest.

Exercise 2. Answer the questions.

1.What device is the clutch?
2.What units does it connect?
3.What is the clutch used for?
4.Where is the clutch placed?
5.What plates does the clutch consist of?
6.What is the basic principal operation of the clutch?
7.What is the clutch controlled by?
8.What takes place when the clutch pedal is at rest?
9.When does the engine run idly?

Exercise 3.Find the proper endings.

1. The clutch is a device connecting ....
a).the rear axle and axle shafts.
b).the gearbox and differential.
c).the engine and the gearbox.
2.The clutch is situated between ....
a).the gearbox and cardan shaft.

b).the flywheel and the gearbox.
c).the gearbox and rear axle.
3.The clutch is controlled by ....
a). the brake pedal
b). the clutch pedal.
c).the gearbox and rear axle.
4.The clutch is engaged ....
a).when the clutch pedal is pressed down.
b).when the clutch pedal is at rest.
5.The clutch is disengaged ....
a).when the clutch pedal is at rest.
b).when the clutch pedal is pressed down.

Exercise 4. Read the dialogue and act it with your partner.

A.: What is the function of the clutch?
B.: You see, it serves three functions. It is used for freeing the engine from the gearbox, for starting the car and for freeing the engine from car wheels.
A.: Is it a friction device?
B.: Yes, of course. It is fixed between the flywheel of the engine and the gearbox and usually consists of two discs.
A.: What discs?
B.: The friction disc (driven disc) and the pressure disc.
A.: I suppose the principle of operation of clutches is a frictional force between discs. Am I right?
B.: Yes, you are. When the clutch is fully engaged the frictional force makes discs rotate at the same speed.
A.: And by what is the clutch controlled?
B:.By the clutch pedal. When it is at rest the clutch is engaged and when it is pressed down the clutch is disengaged and the engine is disconnected from the car wheels.
A.: Thank you. And what types of clutches do you know?
B.: Positive clutches and gradual engagement clutches.
A.: Thank you very much for your information.
B.: Not at all. Glad to help you.

Exercise 5.Find out in the text English equivalents of Ukrainian words.

Функція щеплення, для відключення двигуна від коробки передач, кріпиться між маховиком і коробкою передач, фрикційний диск, натискний диск, сила тертя, щеплення включено, педаль в початковому положенні, педаль щеплення натиснута.

Exercise 6. Match English word-combinations with their Ukrainian equivalents.

1. a friction device	a.	завести автомобіль
2. gearbox	b.	фрикційний диск
3. to start the car	c.	маховик

4. to release the engine	d.	зносостійкий матеріал
5. is fixed	e.	працювати вхолосту
6. flywheel	f.	з'єднуватися
7. the friction disc	g.	сила тертя
8. the pressure disc	h.	роз'єднуватися
9. hard-wearing material	i.	пристрій тертя
10 frictional force	j.	знаходитися в спокої
11 the clutch pedal	k.	закріплений
12 to be engaged	l.	педаль щеплення
13 to be at rest	m.	натиснути педаль
14 to be disengaged	n.	від'єднати двигун
15 to press down on the pedal	o.	натискний диск
16 to run idly	p.	коробка передач

Exercise 7.Chose the proper ending from the words in the box.

freeing the engine from the gearbox, serve, fixed, gearbox, controlled, starting the car, freeing the engine from the car wheels, pedal, at rest, engaged, disengaged, do, located.

A.:What three functions does the clutch ... ?

B.:It is used for ....

A.:Where is it... ?

B.:It is ... between the flywheel of the engine and the ....

A.:By what is the clutch ... ?

B.:It is ...by the....

A.:What takes place when the pedal is ... ?

B.: The clutch is ....

A.: And when the driver pushes down on the pedal?

B.: The clutch is ....

Exercise 8. Translate from Ukrainian into English.

1. Щеплення – пристрій тертя.
2. Щепленняз'єднує двигун і коробку передач.
3. Щеплення розміщено між маховиком та коробкою передач.
4. Як правило , щеплення складається з двох дисків : головного та натискного диску.
5. Щеплення керується педаллю щеплення.

6. Коли педаль щеплення знаходиться в спокої, диски щеплення з'єднані та працюючий двигун з'єднаний з коробкою передач та колесами.
7. Коли водій тисне на педаль щеплення , диски розходяться, щеплення від'єднується та двигун працює в холосту.

Unit 9. Brake System. The Types of Brakes

I. Pre-reading exercises.

1. Remember the following words and word-combinations.

brakes — гальма
force the fluid — подаватирідину
performance - робота
under pressure – підтиском
safety — безпека
brakes are applied — гальма спрацьвують
depend — залежить
slow – уповільнювати
braking effort – гальмівне зусилля
divide - розподіляти
push down on the brake pedal – натиснути на педаль гальм
namely – а саме
drumbrakes — барабанні гальма
bandbrake — стрічкові гальма
diskbrakes – дискові гальма
shoebrake — колодочні гальма
hydraulicassistedbrakes — гальма з гідравлічним приводом
brakeshoes — гальмівні колодки
brakefluid — гальмівна рідина
brakepedal – педаль гальм
mastercylinder – головний циліндр

II. Reading.

1. Read the text.

Brakes

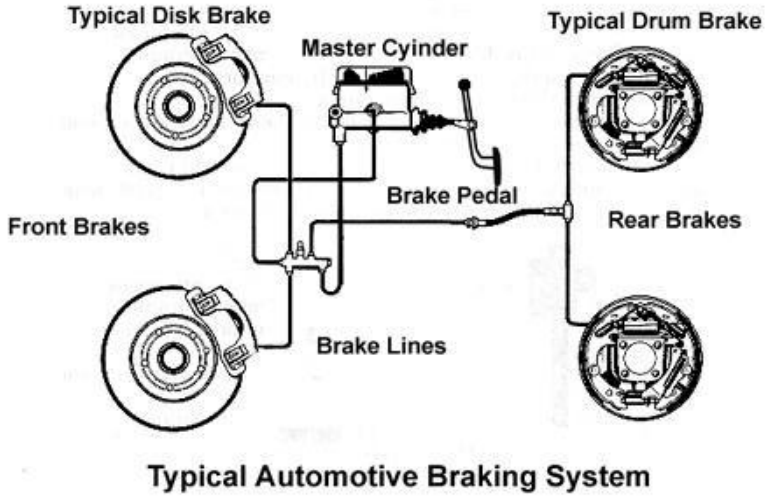
Brakes are used to slow or stop the car where it is necessary. It is one of the most important mechanisms of the car as upon its properperformance the safety of passengers depends. Car brakes can be divided into two types, namely: drum brakes and disc brakes. The drum type may be either a band brake or a shoe brake. Depending on their functions, the automobile has foot brakes and hand brakes (parking brakes). According to their mode of operation, the brakes are classified as: mechanical brakes, hydraulic brakes, airbrakes, electric brakes. Brakes are controlled by the brake pedal.

Most braking systems in use today are hydraulic. This system consists of a master cylinder mounted on the car frame and wheel cylinders. When the driver pushes down on the brake pedal, it forces the piston to move in the master cylinder and brake fluid is delivered from 11 to the wheel cylinders. The piston movement causes brake shoes to move and the brakes are applied (the brake shoes are pressed against the brake drums).

The air brake uses compressed air to apply the braking force to the brake shoes.

Electric brakes use electromagnets to provide the braking effort against the brake shoes.

Formerly brakes were applied only to the two rear wheels, but now all cars are equipped with all-wheels brakes. Today many improvements are being made in brakes.



Picture 7. Brake System

Exercise 1. Find out these word-combinations in the text and write down their English equivalents.

Гальма, безпекапасажирівзалежитьвідправильноїроботигальм, барабаннігальма, дисковігальма, гальмазпідсилювачем, гідравлічнийпривідгальм, рідинапідтиском, гальмаспрацьовуть, гальмівнезусилля, натиснутинапедальгальм.

Exercise 2. Answer the questions.

1. What is the function of the brakes?
2. What types are brakes divided into?
3. What brakes do you know according to their mode of operation?
4. What braking systems are used today?
5. By what are brakes controlled?
6. When are brakes applied?

Exercise3. Match English word-combinations with their Ukrainian equivalents.

1.performance	a. залежати від
2.the safety of passengers	b. барабанні гальма
3.to depend upon	c. гальма спрацьовують
4.namely	d. гальма з гідравлічним приводом

5.drum brakes	e. робота
6.disc brakes	
7.brakes are applied	f. а саме
8.hydraulic assisted brakes	g. гальма з підсилювачем
9.power assisted brakes	h. під тиском
10.to press down on the brake pedal	i. натиснути на педаль гальм
	j. дискові гальма
	k. безпека пасажирів
11.under pressure	

Exercise 4. Find the proper endings.

1.Brakes are used for...	a. disc brakes and drum brakes
2.Brakes are one of ...	b. the driver pushes down on the pedal
3. Brakes may be of 2 types	c. the brake pedal
4. Brakes are applied by	d. stopping the car
5. Brakes are applied when	e. the most important mechanism of the car

Exercise 5. Translate from Ukrainian into English.

1.Гальма є найбільш важливим механізмом автомобіля.

2.Вони використовуються для уповільнення руху та зупинки автомобіля.

3.Гальма можно поділити на два типи а саме: барабанні та дискові гальма .

4.У бішості автомобілів використовується гідравлічний або пневматичний привід.

5.Гальма спрацьовують коли водій натискає на гальмівну педаль.

Exercise 6. Read the dialogue and act it with your partner.

DIALOGUE

Alex: Why are brakes used?
Boris: They are used to stop or to slow the car.
A.: Well, it is one of the most important mechanisms of the car, isn't it?
B.:Of course, the safety of the passengers depends upon their proper performance.
A.:What types of brakes are used today?
B.:Drum brakes, disk brakes and others.
A.:And in what way are they applied?
B.:They are applied by the brake pedal. When the driver pushes down on the pedal they are applied.
A.:Thank you. It was very nice of you to tell me this information.
B.:Don't mention it. I was glad to serve you.

Additional task

Troubles in Braking System

The basic troubles of the braking system are as follows:
1. poor braking action;
2. sticking brake shoes which would not return to the initial position after a brake pedal is released;
3. non-uniform braking of the left and the right wheels on a common axle;
4. leakage of brake fluid and air leakage in the hydraulic brake;
5. poor air tightness of the pneumatic brake control.

What to do:

1. Check the action of the foot and hand brakes and leak proofness of the brake hoses connections, components of the hydraulic and pneumatic controls of the brakes, as well as of the vacuum- power system.
2. Inspect the friction linings, wheel-brake springs, master and wheel cylinders of the hydraulic brake and the air compressor of the pneumatic brake using a test manometer to check it.

Unit 10. Gearbox

I. Pre-reading exercises.

1. Remember the following words and word-combinations.

gear — шестерня, передача
gearbox - коробка передач
gearing – зубчасте з'єднання
roadconditions — дорожні умови
forwardspeed — поступальна швидкість
reversedrive – зворотній привід
lowgear – нижча передача
topgear — вища передача
sliding-meshgearbox – коробка передач з ковзаючими шестернями
constant-meshgearbox- кробка передач постійного зчеплення
epicyclic (planetary) gearbox–планетарна коробка передач
ordinarygearing — звичайний редуктор
characteristicfeature — характерна особливість
fixedaxes–фіксовані осі
rotatebodyly — повертатися корпусом
axle — вал, вісь
secure — забезпечити
shifting – перемикання
in direct line-важливо

II. Reading.

1. Read the text.

Gearbox

The gearbox is placed between the clutch and the propeller shaft. The principal function of the gearbox is to vary the speed of the car movement to meet the road

conditions. The gearbox provides four forward speeds and one reverse, as follows:
1. First or low gear;
2.Second gear;
3.Third gear;
4.Fourth or top gear;
5.Reverse gear.

There are many constructional arrangements of gearboxes, which can be classified as follows:

1.Sliding-mesh type;
2.Constant-mesh type;
3.Epicyclic (planetary) type.

The sliding-mesh type is the simplest one and is the oldest historically. The constant-mesh type is the most widely used type. They are termed "ordinary" gearing, the characteristic feature of which is that I lie axes of the various gears are fixed axes. The gears simply rotate about their own axes.

The characteristic feature of epicyclic (planetary) gearing is that one gear rotates about its own axis and also rotates bodily about some other axis.

To secure the several speeds of the car the clutch shaft is mounted In direct line with the gearbox shaft. The gearbox shaft carries on it the sliding gears which are used for shifting to secure the forward speeds and the reverse drive.

Excersice 1. Find answers in the text.

1.Where is the gearbox situated?
2.What is the function of the gearbox?
3.What speeds does the gearbox provide?
4.What types of gearboxes do you know?
5.Why is the clutch shaft mouned in direct line with the gearbox shaft?

Exercise 2.Find the proper endings.

1.The principal function of the gearbox is....	a) sliding-mesh type, constant mesh type and planetary type
2.The gearbox provides	b) the simplest one and historically oldest
3.Gearbox can be	c) to vary the speed of the car
4.The sliding-mesh gearbox is …	d) four forward speeds and one reverse
5.The constant-mesh gearbox is....	e) the most widely used.

Exercise 3. Translate from Ukrainian into English.

1.Коробка передач призначена для зміни швидкості руху автомобіля.
2.Коробка передач забезпечує чотири поступальні швидкості і одну задню.
3.Коробки передач можуть бути: з ковзаючими шестернями, з постійним зачепленням шестерень і планетарного типу.
4.Найпростішими є коробки передач з ковзаючими шестернями.
5.Ковзаючі шестерні на валу коробки передач використовуються для забезпечення передніх швидкостей і зворотного ходу.

Exercise 4. Read the dialogue and act it with your partner

DIALOGUE

Mike: Peter, do you remember what our teacher told us last time?
What do you know about gearboxes?
Peter: I know that the gearbox is used to change the speed of the car.
M.: And how many speeds does the gearbox provide?
P.: It can provide four forward speeds and one reverse.
M.: Into what types are the gearboxes divided according to their arrangements?
P.: They are divided into sliding-mesh type, constant-mesh type
and epicyclic type.
M.: What type is the simplest?
P.: The sliding-mesh one.
M.: Thank you very much for you help.
P.: You are welcome. Glad to help you.

Additional Tasks

1. Read the text and choose the word which belongs to the text (one in each group).

Automatic transmission

An automatic transmission contains special devices that automatically provide various gear ratios as they are needed. Most automatic transmissions have three or four (forward, front) gears and a (reverse, rear, back) gear. Instead of a gear-shift, the driver operates a (lever, stick) called a selector. Most automatic transmissions have selector positions: park, neutral, drive, low, and reverse. The engine can be started only if the selector is in either the park or (neutral, zero) position. In park, the drive shaft is locked so that the drive wheels cannot move.

For ordinary driving, the driver moves the selector to the (drive, neutral) position. The transmission starts out in the lowest gear and automatically shifts into (higher, bigger) gears as the car (picks up, collects) speed. The driver uses the low position of the transmission for going up or down steep hills or driving through snow or mud. When in low, the transmission remains in the lowest gear.

2. Explain the principle of work of the automatic transmission, using the word combinations:

• operates a lever called a selector
• has selector positions: park, neutral, drive, low, and reverse
• to move the selector to the drive position
• starts out in the lowest gear
• automatically shifts into higher gears

Unit 11. Steering System

I. Pre-reading exercises.

1. Remember the following words and word-combinations.

guide the car – керувати автомобілем
means of turning- засіб виконання повороту
front wheels –передні колеса
steering wheel – рульове колесо
steering column- рульова колонка
for this purpose – з цією метою
pivot– шарнір
swing (swang, swung)- повертатися
steeringknucklearm - важіль поворотного кулака
tie-rod- поперечна тяга
inturn – в свою чергу
pitmanarm- рульова сошка
rackandpinionassembly- рульовий механізм з рейкою та шестернею
ball joint – кульовий шарнір
leverage – система важелів
hose-шланг
steeringgearassembly- рульовий механізм
rack and pinion type– рейково шестерний тип
recirculating ball steering – рульовий механізм з кульовою гайкою
injury – пошкодження
steeringbox- картер рульового механізму

II. Reading.

1. Before you read the passage, talk about these questions.

1 How do drivers direct a car?
2 What connects the steering wheel to the restof the steering system?

2. Read the text.

TEXT

Steering System

To guide the car, it is necessary to have some means of turning the front wheels so that the car can be pointed in the direction the driver wants to go. The steering wheel in front of the driver is linked by gears and levers to the front wheels for this purpose. The front wheels are on pivots so they can be swung to the left or right. They are attached by steering knuckle arms to the rods. The tie-rods are, in turn, attached to the pitman arm.

When the steering wheel is turned, gearing in the steering gear assembly causes the pitman arm to turn to the left or right. This movement is carried by the tie-rods to the steering knuckle arms, and wheels, musing them to turn to the left or right.

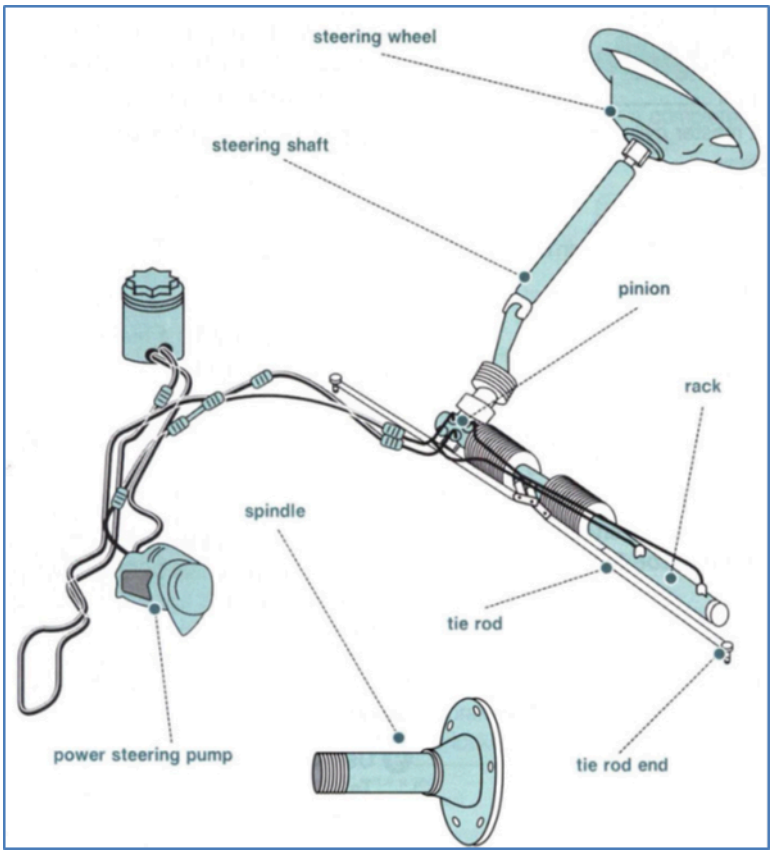
The steering system incorporates: the steering wheel and column, steering gear, pitman arm, steering knuckle arm, front axle, steering knuckle pivot, tie-rods.

There are several different manual steering gears in current use, such as the rack and pinion type and the recirculating ball type. The rack and pinion steering gear is widely used. Another manual steering gear which is popular in imported cars is the worm and sector type.

The steering wheel and column are the source of injury to the driver, air bags and other devices being developed now to safe the life of a driver.

Energy-absorbing columns must stop the steering wheel and column from being pushed to the rear as the front of the car is crushed in an impact.

Energy-absorbing columns must also provide the driver with a tolerable impact as he moves forward and strikes the wheel with his chest.



Picture 8. Steering system

III. Post-reading exercises

Exersice 1. Find the answers in the text.

1.What mechanism is necessary to guide the car?
2.How is the steering wheel connected to the front wheels?
3.Why can the front wheels be swung to the left or to the right?
4.What does the manual steering system incorporate?
5.What types of manual steering gears in use do you know?

Exercise 2. Find the proper endings.

1.The front wheels are on pivots so... 2.When the steering wheel is turned... 3.The steering wheel is … 4.Most manufacturers use... 5.Steering gear may be... 6.Steering knuckle arms and wheels are turned...	a. by the tie-rods. b. rack and pinion type, recirculating ball type, warm and sector type. c. gearing in the steering system causes the pitman arm to turn. d. rack and pinion type. e. they can be swung to the left or right. f. by gears and levers to the front wheels.

Exercise 3.Find out English equivalent in the text.

Керувати автомобілем, засіб повороту колес**,** пов'язаний шестернями і важелями, передні колеса на шарнірах, прикріплений до важеля поворотного кулака стрижнями, привід рульового механізму змушує рульову сошку повертатися вліво або вправо, цей поворот здійснюється за рахунок поперечної тяги до важіля поворотного кулака, передній міст, рульовий механізм з кульовою гайкою, рульова передача із зубчастим сектором, джерело пошкодження для водія, зберегти життя водія.

Exercise 4.Translate from Ukrainian into English.

1.Для управління автомобілем необхідна система рульового управління
2.Рульове управління включає в себе: рульове колесо і рульову колонку, зубчасте з'єднання, рульову сошку, важіль поворотного кулака і шарнірні з'єднання, важелі і поперечні тяги.
3.Існують різні типи кермових механізмів, а саме: рейково-шестерний тип, механізм з кульової гайкою, механізм із зубчастим сектором.
4.Коли водій повертає кермо вліво або вправо, то рульовий механізм змушує рульову сошку повертатися вліво або вправо.
5.Цей рух передається поперечними тягами до важелів поворотних кулаків і до коліс, змушуючи їх обертатися вліво або вправо.

Exercise 5. Read the dialog and perform it with your partner.

DIALOGUE

Stas: Look here. I have some troubles with the steering system.
Vlad: What troubles?
S.: The first is excessive free play of the steering wheel.
V.: You should check free play of the steering wheel and steering gear performance.
S.: The second problem is oil leakage from the steering gear case.
V.: Check the steering gear case for oil leakage visually. Anything else?
S.: Sure. It is disadjustment of the steering gear. And I don't know what to do.
V.: You see, in this case it is better for you to go to a repairing shop. Good specialists should do this job.
S.: Thank you very much.
V.: Not at all.

Additional exercises

1.Read the chapter on auto repair.

Rack and pinion steering is one of the most common steering systems used today. But few people actually know how it works.

It all starts with the steering wheel. It turns a steering shaft, which is attached to the pinion. The pinion, a gear, locks with the rack, another gear. So when you rotate the wheel, the steering shaft turns the pinion. The pinion then turns the rack.

Attached to each side of the rack are inner and outer tie rods. These rods connect to the spindles. As the rack pulls and pushes the rods, they move the spindles. And it is the spindles that hold the wheels. By turning the spindle, the rods turn the wheel.

Most modern cars also have power steering. In these systems, the rack has a cylinder with a piston in the middle. The power steering pump supplies high pressure fluid to move the piston. This reduces the amount of force needed to turn the pinion gear and rack.

2. Mark the following statements as true (T) or false (F).

1. The tie rods connect to the control arms and pinion.
2.The tie rods turn the spindles.
3. Power steering removes gears from a steering system.

3. Match the words (1-5) with the definitions(A-E).

1 spindle
2 rotate
3 steering shaft
4 power steering
5 rack

A. a system that makes turning easier
B. a gear that moves the tie rods
C. to turn something in a circular motion

D. a piece that connects the steering wheel to
the pinion
E. a part that holds wheels in place

4. Fill in the blanks with the correct words and phrases from the box.

Powersteering pump, pinion, tie rod, steering system, steering wheel

1 The_____ is connected to the rack and spindle.
2 High pressure flu id is moved by the _____ .
3 The rack is turned by the _____.
4 Every turn starts by moving the _____.
5 The_____ is a combination of several parts, including wheels, rods, and gears.

Unit 12. Car Repair and Maintenance

“Don't find fault, find a remedy.”

Henry Ford

Basic vocabulary
preventive-профілактичний
care-догляд
to last longer-служити довше
to avoid- запобігати
to produce- виробляти
pollution-забруднення
to be well-maintained– бути гарно обслуженим
regular oil changes – регулярна заміна масла
corrosion -корозія
minor concerns - незначні проблеми
to cause serious problems – спричиняти серйозні поблеми
repair-ремонт
overheating- перегрівання
timmingbelt- ремінь ГРМ
schedule- графік
costly repairs - дорогий ремонт
original parts- оригінальні деталі

II. Reading.
1. ***Read the text.***

Few basic car maintenance tips

Preventive maintenance is important to keep your car safe. With proper care your car will last longer and some of the possible problems can be avoided. Well-maintained car is not only safer, it’s also more economical and produces less pollutions. If the car is well-maintained, you can expect higher price when you decide to sell it.

Regular oil changes are very important to keep your engine in a good shape.
Wash your car regularly, wax it occasionally to keep the car body shiny and free from corrosion.
Take care of any minor concerns as soon as you can, so it won't cause serious problems and an expensive repair later.
Avoid overheating the engine.
Changing spark plugs, air filter, timing belt and other items according to maintenance schedule may save you from costly repairs.
Use only original parts.

Exercise 2. Give the English equivalents to the word combinations and phrases.
Профілактичне обслуговування, час від часу, вберегти кузов від корозії , спричиняти серйозні проблеми, утримувати двигун в гарному стані, автомобіль слугуватиме довше, можливо уникнути проблем.
Exercise 3. There are certain vehicle components that need periodical replacement. Make up sentences to explain what damages the faulty device can cause, using the information from the table.
Example: Dirty fuel filter may cause engine stalling and loss of engine power.

Device	**damage the faulty device can cause**
dirty fuel filter	engine stalling and loss of engine power
dirty air filter	loss of engine power, increased fuel consumption, air flow sensor failure, etc.
old engine coolant	loses its anti-corrosive and other characteristics and may cause water pump to fail
spark plugs	spark plugs replacement can signify- cantly improve the engine performance
timing belt (зубчатый ремень привода)	cause serious engine damage, especially if it's a diesel engine
fuel injectors	a problem with fuel consumption

Exercise 4. Read the text and fi ll in the gaps with the words and word combinations:

pressure, plugs, filter, injectors, tune-up, oil, gas, warmed up.

Few tips how to improve emission test results

– Change the engine … before testing. For old or high mileage car (автомобіль з великим пробігом) using thicker oil may help.
– Change the spark … and the air … if you changed them a long time ago.
– Complete … may be an option for older cars.
– Flushing (промивання) the fuel … usually helps.

Before the test:
– Check and adjust a tyre … .
– Fill the car with premium … .
– Make sure, the engine is fully … before test.

Exercise 5. Answer the following questions.

1. Preventive maintenance is important to keep the car safe, isn't it?
2. Why should we take care of any minor concerns as soon as possible?
3. What a driver or a car mechanic should do to keep the engine in a good shape?
4. Do we need to undertake anything if the fuel fi lter is dirty?
5. What fault device can cause loss of engine power and increased fuel consumption?

Additional exercises.

Exercise 1. Match a–l with 1–12.

a) The fuel tank leaks.	1) Підвищена витрата масла.
b) The engine gets overheated from time to time.	2) У приймальні труби (приймальному колекторі) діра.
c) Abnormal oil consumption.	3)Промийте радіатор струменем води.
d) Intake manifold has a hole in it.	4) Протікає бензобак
e) Jacket water has frozen.	5) Карбюратор потрібно розібрати і почистити.
f) Flush the radiator.	6) Час від часу двигун перегрівається.
g) The carburettor has to be dismant - led and cleaned.	7) Вода в охолоджуючої сорочці замерзла.
h) Blow through the fuel piping.	8) Гальмівна педаль запала.
i) The brake pedal has fallen through.	9) Продуйте паливну магістраль.
j) Bleed the braking system.	10) Відрегулюйте ручне гальмо.
k) Adjust the hand brake.	11) Немає запалювання.
l) It doesn't ignite.	12) Прокачайте гальмівну систему.

Exercise 2.Read the following text and fi ll in the gaps with the words below.

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

Finding a fault in a car

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

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

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

Exercise 3. Use the information from the text to complete the dialogue. Act it out.

Client: Could I ask you for advice? You see, my car doesn't start in the morning. What should I do?

You:… .

Client: But I checked the battery yesterday. It was fl at. I tried to recharge it, but it was still fl at. What do I do next?

You: … .

Client: If the gap in a spark plug is too narrow, how to adjust it?

You:… .

Client: How do you know that the starter motor might be jammed?

You:… .

Client: How can I repair this fault?

You:… .

Client: But I pushed the car forwards and backwards, the starter still didn't work.

You:… .

Client: Thank you. You were very helpful.

Unit 13. Car Driving. Roads and Road's Signs

I.Basic vocabulary

extensive network-велика мережа
modern motorways-сучасні автошляхи
travel on the left-hand side of the road- їздити по лівій стороні дороги
overtake on the right- обгін справа
priority-пріоритет
roundabouts-круговийрух
courtesy and consideration- ввічливість і увагу
seatbelts – ремінь безпеки
strictrules- суворі правила
permitted speed – дозволена швидкість
infringement of parking regulations-порушення правил паркування
fines- штрафи
wheel clamps- колісні затискачі

II. Reading.

1. ***Read the text.***

Driving in Britain

Britain has a very extensive network of modern motorways and roads linking all its main cities. When visiting Britain, the driver from abroad should remember a number of differences in using the roads. In contrast to other countries, cars in Britain travel on the left-hand side of the road and overtake on the right, which may cause some problems, especially if the traveller's car has right-hand drive. It should also be remembered that priority must always be given to cars coming from the right, particularly at roundabouts.

British drivers are known for their courtesy and consideration. Both drivers and front-seat passengers are obliged to wear seatbelts. There are very strict rules against drinking. The maximum permitted speed in townsand built-up areas is only 30 mph (about 50 km/h).

In big cities drivers have problems with parking, especially in the centre. Infringement of parking regulations can result in fines, wheel clamps or even the removal of a vehicle by the police. Driving is more enjoyable on modern motorways on which drivers may maintain a speed of 70 miles per hour (112 km/h).

Exercise 1.Give the English equivalents to the word combinations and phrases.

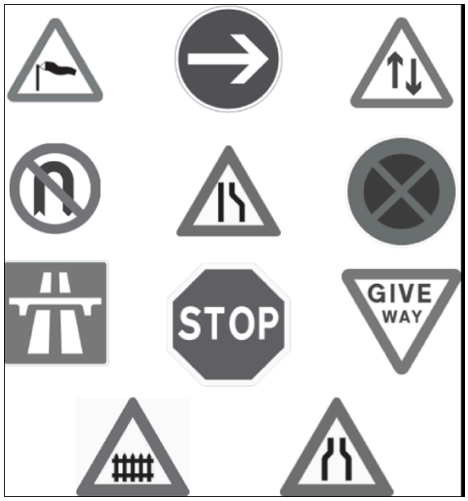
Велика мережа доріг, водій з-за кордону повинен пам'ятати, на відміну від інших країн, їздити по лівій стороні дороги, обганяти з права, пріорітет повинен надаватися, особливо на круговому русі, одягати ремінь безпеки, суворі правила щодо вживання алкоголю, максимально дозволена швидкість, спричиняти штрафи, забирання автомобіля поліцією, сучасні автошляхи.

Exercise 2. Mark the following sentenses as true (T) or false (F).

1. Britain has a little network of modern motorways and roads linking all its main cities.
2. In contrast to other countries, cars in Britain travel on the left-hand side of the road and overtake on the right, which may cause some problems, especially if the traveller's car has right-hand drive.
3. It should also be remembered that priority must always be given to cars coming from the left, particularly at roundabouts.
4. Both drivers and front-seat passengers are obliged to wear seat-belts.
5. The maximum permitted speed in townsand built-up areas is only 50 mph.
6. In big cities drivers have a lot of places to park, especially in the centre.

Exercise 3. Match the pictures of the road signs with their names from the list.

1. Two-way traffic straight ahead.
2. Stop and give way.
3. Give way to traffic on major road (yield).
4. No U-turns.
5. Road narrows on both sides.
6. Road narrows on right.
7. Side winds.
8. Level crossing with barrier or gate ahead.
9. No stopping (clearway).
10. Turn right.
11. Motorway.



Exercise 4.Find the synonyms and translate the words into Ukrainian.

1 Extensive	a) Violation
2 Priority	b) huge
3 Strict	c) zebra crossing
4 Fines	d) highway
5 Infringement	e) penalty
6 Motorway	f) precedence
7 Overtake	g) harsh
8 Junction	h) surpass

Exercise 5. Fill in the gaps using the following words: extensive network, overtake, courtesy, consideration, infringement, junction, helmet, pedestrians.

1. Motorcyclist have to wear _____.
2. Drivers have to stop at the _____.
3. Our town hasn't got an _____.
4. It's very dangerous to_____ on the right.
5. British drivers are known for their _____ and _____.
6. _____ of road rules can result in fines.
7. Accidents with_____ usually happen on or near zebra crossing.

Exercise 6. Translate the sentences into English

1.Британія має велику мережу сучасних автошляхів.

2.Існує багато відмінностей між українськими та британськими дорогами.

3. Водії зобов'язані пристібати ремені безпеки.

4.Порушення правил дорожнього руху може привести до штрафів.

5.Мотоциклісти, що не одягають шолом, піддаються великому ризику.

6.Зазвичай аварії з пішоходами трапляються на чи біля пішоходів.

Supplementary Tasks

Exercise 1. Read and translate the text

Basic vocabulary

Cyclist- велосипедист
helmet- шолом
junction- перехрестя
motorcyclist- мотоцикліст
pedestrian- пішоход
zebra crossing- пішохідний перехід

Road Safety in Britain

The first death in a car accident in Britain was on 23 February, 1899. A drive turned a corne at a speed of 40 kph and the crashed. In those days, cars didn't have seat belts and the driver died.

In 1998, a survey showed the following information:

Road user deaths
Drivers1,850
Motocyclists 500
Cyclists 150
Pedestrians 900

For many years motorcyclists took risks because they didn't wear helmets and many motocyclists died. The law changed in 1972. Then motorcyclists had to wear helmets to protect their heads.

The survey showed that the majority of bicycle accidents were with boys 12-15 yaers old. The survey showed that these boys had accidens because:

- they didn't look before they turned right
- they didn't stop at a junction
- cars didn't see them

The survey also showed that 20% of accidents with pedestrians happened on or near a zebra crossing. It didn't show why.

Exercise 2. Are these sentences true or false?

1.The first death in a car crash was in 1899.
2. Nine hundred motorcyclists died on the roads in 1998.

3. The law changed in 1979 and then motocyclists had to wear helmets.
4. Accidents with cyclists are common in the 15-17 age group.
5. Accidents with pedestrians usually happen on or near zebra crossings.

Exercise 3. Find the synonyms and translate the words into Ukrainian.

1. violation	a. extensive
2. huge	b. priority
3. zebra crossing	c. strict
4. highway	d. fines
5. penalty	e. infringement
6. precedence	f. motorway
7. harsh	g. overtake
8. surpass	h. junction

Exercise 4.Fill in the gaps using the following words: extensive network, overtake, courtesy, consideration, infringement, junction, helmet, pedestrians.

1. Motorcyclist have to wear _____.
2. Drivers have to stop at the _____.
3. Our town hasn't got an _____.
4. It's very dangerous to_____ on the right.
5. British drivers are known for their _____ and _____.
6. _____ of road rules can result in fines.
7. Accidents with_____ usually happen on or near zebra crossing.

Unit 14. Cars and Environment.

I.Basic vocabulary

permanent blanket of smog-постійне ковдра смогу
global warming- глобальне потепління
car manufacturers- виробники машин
to invent a vehicle- винаходити автомобіль
to replace engines- замінити двигун
several drawbacks- декілька недоліків
to recharge- перезаряджати
steep hill – крутий пагорб
extremely light- дуже легка

II. Reading.

1. ***Read the text.***

Many of the world's cities lie under a permanent blanket of smog. People are concerned about global warming, and fuel prices just keep going up and up. In recent years car manufacturers have been put under pressure to invent a vehicle that is both cheaper to run and better for the environment.

One of the first ideas which car manufacturers tried, was to replace engines which run on fossil fuels with electric motors. Unfortunately, these vehicles had several drawbacks and they didn't sell very well. The problemswere that the batteries of these electric cars ran out very quickly and took a long time to recharge.

Car manufacturers have improved the concept so that environmentally friendly cars can now be efficient and economical as well. The hybrid car, which has both an electric

motor and a traditional petrol engine, comes in.The electric motor never needs to be recharged and it is much better for the planet than a traditional car.

In a hybrid car, the engine is controlled by a computer which determines whether the car runs on petrol, electricity, or both. When the car needs maximum power, for example, if it is accelerating or climbing a steep hill, it uses all of its resources, whereas at steady speeds it runs only on petrol.When slowing down or braking, the electric motor recharges its batteries.

Hybrid cars are made using materials such as aluminium and carbon fibre (вуглеродне волокно), which makes them extremely light. Hybrid cars arebetter for the environment because they use far less petrol than normal cars,so they produce less pollution.

Of course, hybrid cars aren't perfect; they still run on fossil fuel andso pollute the environment to some extent. However, they may be the firststep along the road to cleaner, 'greener' cars. Car manufacturers are alreadyworking on vehicles which run on hydrogen (водень).The only emissionfrom these cars is harmless water vapour. These are still some way in thefuture, though, as designers need to think of cheap and safe ways of producing,transporting and storing hydrogen, but at last, it looks like we mightbe heading in the right direction.

Exercise 2. Match a–l with 1–12.

a) environmentally friendly cars	1) водень
b) global warming	2)вуглеродне волокно
c) keep going up and up	3)ніколи не потребують перезарядки
d) have been put under pressure	4) викопне паливо
e) fossil fuel	5)гибридний автомобіль
f) electric motor	6)продовжують підніматися
g) drawbacks	7) були піддані тиску
h) the hybrid car	8) нешкідливі для навколишнього середовища автомобілі
i) never needs to be recharged	9) глобальне потепління
j) carbon fi bre	10) безпечний водяна пара
k) hydrogen	11) недоліки
l) harmless water vapour	12)електродвигун

***Exercise 3.*Give the English equivalents to the following word combinations.**

Працювати на викопному топливі, довгий час для перезарядки, традиційний автомобіль, при уповільненні руху або гальмуванні, дуже легкий, набагато менше бензину, до певної міри, первый крок на шляху до.

Exercise 4.Complete the sentences with the correct variant.

1. Car manufacturers are trying to invent a new vehicle because

a) today’s cars produce too much poisonous gas;
b) today's cars produce too much power;
c) today's cars move too fast.
2. Vehicles which ran on electric motors
a) moved too slowly;
b) were not very popular;
c) had to have their engines replaced.
3. The electric motor in hybrid cars
a) doesn’t need to recharge its batteries;
b) has its own petrol engine;
c) takes a long time to be recharged.
4. The computer in a hybrid car
a) helps the car to go up hills;
b) keeps the car running at a steady speed;
c) decides how the car should be powered in any given time.
5. Hybrid cars are better for the planet because
a) they use different fuels;
b) the electric motor is smaller than a normal engine;
c) they produce less harmful gases.

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Notes