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**АНГЛІЙСЬКА МОВА ДЛЯ СТУДЕНТІВ-АВТОМОБІЛІСТІВ**



Міністерство освіти і науки України  
Вінницький національний технічний університет

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Посібник призначено для розвитку практичних умінь і навичок іншомовного спілкування та розуміння фахово спрямованої літератури іноземною мовою.

Рекомендовано для підготовки студентів зі спеціальності «Автомобільний транспорт». Посібник містить навчальний матеріал, що відповідає програмі курсу англійської мови, яка вивчається у технічних закладах вищої освіти. Завданням рукопису є забезпечення знань, необхідних фахівцям для роботи у галузі транспорту та транспортної інфраструктури.

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## UNIT 1 WHAT IS AUTOMOBILE

### *Ex. 1. Learn the vocabulary*

accidents – аварійність  
air pollution – забруднення повітря  
alter – змінювати  
axle ['æks(ə)l] – вісь, вал  
bump [bemp] – глухий удар, зіткнення  
car frame – шасі  
cargo – вантаж  
cushion ['kʊʃ(ə)n] – обладнувати подушкою  
drive shaft – вал трансмісії  
drivetrain – трансмісія  
exhaust [ig'zɔ:st] – вихлопні гази (двигуна)  
gear [giə] – механізм, привід  
horseless carriage – екіпаж, що рухається сам  
injury – пошкодження  
injury ['indʒəri] – тілесне ушкодження, травма  
load – вантаж  
lubricate – змащувати  
lubricate [lu:'brɪkeɪt] – змазувати, мастити (машину)  
mud [mɛd] – грязь, болото  
omnibus – приміський автобус  
self-propelled [prə'pel] – з автономним приводом  
shock absorber – амортизатор  
sport-utility vehicle – спортивне легкове авто  
spring – пружина, ресора  
suburbs – передмістя  
suspension [sə'spenʃ(ə)n] – підвіска  
vehicle – транспортний засіб

### *Ex. 2. Read and translate the text*

Automobile is a self-propelled vehicle, used primarily on public roads but adaptable to other surfaces. Automobiles changed the world during the 20<sup>th</sup> century. From the growth of suburbs to the development of road and highway systems, the so-called horseless carriage has forever altered the modern landscape. The manufacture, sale and servicing of automobiles have become key elements of industrial economies. But along with greater mobility and job creation, the automobile has brought noise and air pollution, and automobile accidents rank among the leading causes of death and injury throughout the world. But for better or worse, the 1900s can be called the Age of the Automobile, and cars will no doubt continue to shape our culture and economy well into the 21<sup>st</sup> century.

Automobiles are classified by size, style, number of doors and intended use. The typical automobile, also called a car, auto, motorcar, and passenger car, has four wheels and can carry up to six people, including a driver. Larger vehicles designed to carry more passengers are called vans, minivans, omnibuses or buses. Those used to carry cargo are called pickups or trucks, depending on their size and design. Minivans are van-style vehicles built on a passenger car frame that can usually carry up to eight passengers. Sport-utility vehicles, also known as SUVs, are more rugged than passenger cars and are designed for driving in mud or snow.

The automobile is built around an engine. Various systems supply the engine with fuel, cool it during operation, lubricate its moving parts, and remove exhaust gases it creates. The engine produces mechanical power that is transmitted to the automobile's wheels through a drivetrain, which includes a transmission, one or more drive shafts, a differential gear and axles. Suspension systems, which include springs and shock absorbers, cushion the ride and help protect the vehicle from being damaged by bumps, heavy loads and other stresses.

***Ex. 3. Answer the following questions***

1. Where are automobiles primarily used?
2. How did automobiles change the world during the 20<sup>th</sup> century?
3. What key elements of industrial economies have become significant?
4. What kinds of disadvantages have appeared with the development of automobiles?
5. How do we call the 1900s concerning the evolving of automobile industry?
6. What is the classification of automobiles?
7. How many people can an automobile carry up?
8. How are vehicles designed to carry more than 6 passengers called?
9. What is the purpose of SUVs?
10. What is the main part of an automobile?
11. Why do we need to use various systems of engine?

***Ex. 4. Decide if the following sentences are true (T) or false (F)***

1. The 1900s can be called the Age of the Automobile.
2. The typical automobile can carry up to eight people, including a driver.
3. Automobiles changed the world during the 18<sup>th</sup> century.
4. So-called horseless carriage has forever altered the modern landscape.
5. The automobile has never brought noise and air pollution.
6. The engine produces electrical power that is transmitted to the automobile's wheels through a drivetrain.
7. Suspension systems help protecting the vehicle from being damaged by bumps.
8. The price, colour and size of automobiles have become key elements of industrial economies.

9. Larger vehicles designed to carry more passengers are called vans, minivans, omnibuses or buses.

10. Minivans are SUVs vehicles built on a passenger car frame that can usually carry up to ten passengers.

***Ex. 5. Translate the following sentences into English***

1. У середині автомобіля знаходиться двигун.

2. Ця система двигуна охолоджує його під час руху.

3. Мінівени здатні перевозити до восьми пасажирів.

4. Кінець 19-го сторіччя може називатися епохою автомобіля.

5. Двигун виробляє механічну енергію, яка передається на колеса автомобіля.

6. Спортивне легкове авто має більш жорстку конструкцію, ніж пасажирське авто.

7. Амортизатори допомагають захистити авто від пошкоджень на нерівних дорогах.

8. Звичайний автомобіль може перевозити до шести пасажирів, разом з водієм.

9. Кожен автомобіль має систему, яка видаляє відпрацьовані гази, які він створює.

10. У 1891 році Рене Панар та Еміль Левассор створили перший «безкінний» екіпаж з силовим агрегатом, яким був двигун.

11. Більшість сучасних автомобілів мають чотири колеса, рідинне або повітряне охолодження двигуна та сам двигун.

12. Розмір, стиль, кількість дверей та призначення для користування є ключовими моментами під час купівлі автомобіля.

***Ex. 6. Prepare reports using Internet or other sources (catalogues, magazines, books, etc.) about the latest news, achievements in the field concerning the topic of the unit***

## UNIT 2

### ROAD SYSTEMS. PUBLIC TRANSPORTATION

#### *Ex. 1. Learn the vocabulary*

banning – заборона

bicycle path – велосипедна доріжка

blockage ['blɒkɪdʒ] – блокування

Baltimore ['bɔltɪmə] – місто в США, штат Меріленд

cheap – дешевий, недорогий

comprehensive – всеосяжний, широкий

consume [kən'sju:m] – споживати, витратити

current – нинішній, сучасний

Dallas [daləs, dæləs] – місто в США, штат Техас

efficient [i'fi:ʃ(ə)nt] – ефективний, раціональний

encourage [in'kerɪdʒ] – заохочувати

ferry – пором

highway – автомагістраль, автострада

insist – наполягати

lane – смуга руху

move about – рухатися, пересуватися

parking lot – стоянка

swift – швидкий

Texas ['teksəs] – штат Техас в США

the tube = the underground – підземка

traffic jam – транспортний затор

vehicles ['vi:k(ə)l] – автотранспорт

wealthy [welθi] – багатий, заможний

wise – мудрий, обізнаний, тямущий

#### *Ex. 2. Read and translate the text*

Many of the world's major cities were built long before the car appeared and people realized the need to built efficient road systems. Current traffic management problems may be connected with old city planning.

The thing that saves some of these cities is an effective public transport system, usually below the ground. London has an old but effective underground train system known as the tube, and a comprehensive bus and train system above the ground. Hong Kong has cheap, swift and effective public transport in the form of Mass Transit Railway, buses and ferries.





But there are newly built cities, such as, for example, Dallas, Baltimore and Los Angeles in America. Dallas is a wealthy city in Texas, which has grown up in an era when cars were considered to be essential to move about. It has an excellent road system, as does Baltimore, another new city with wise city leaders who insisted on building good roads. However, the public transport system in both Baltimore and Dallas is extremely poor. As a result, travel in these cities is easy except for peak hour, when a twenty minute run can take more than an hour in traffic jams. Los Angeles suffers from chronic highway blockages, despite efforts to encourage people to use public transport.

Cities with good road systems can use other methods to reduce the number of vehicles travelling together at peak hour. Flexible time is one good method: offices open and close at different times so people are travelling to and from work at different times. Vehicles carrying more than one person can use special priority lanes, so they can travel more quickly. There are even systems to make peak hours car use more expensive, with electronic chips recording the presence of a vehicle in a given high traffic area at a given time.

In most capital cities built long before the time of the private car there is, rarely enough space for moving traffic, and certainly not enough for parking vehicles. Buses move slowly because of the great volume of traffic, thus encouraging more people to give up using public transport. Banning traffic from some areas may help, but such a solution may not actually make less the number of cars coming into the city. The new city cannot survive without building a series of ring roads. During the working hours of the day, there is the constant noise of traffic, but at night the center is almost empty.

The most environmentally-friendly way of solving traffic problems is to use more widely public transportation. Buses require fewer parking lots, make less noise and use less road space per passenger than private cars. They consume less fuel, causing less air pollution.

Some environmentalists dream of turning parking lots into parks and replacing cars with bicycles. In some countries there are extensive networks of bicycle paths, which make cycling a safe and enjoyable form of transportation.

***Ex. 3. Answer the following questions***

1. What are current traffic management problems connected with?
2. What public transport system is considered effective?
3. What things save some of big cities from traffic problems?
4. What American cities have excellent road systems?
5. How long does it take to stay in traffic jams in Dallas?
6. What does Los Angeles suffer from?
7. In what way can cities with good road systems reduce the number of vehicles at peak hour?
8. Why do more people in capital cities give up using public transport?
9. When is the center of capital cities almost empty?
10. What kind of transport is mostly used in your city or town?

11. Which form of transportation is mostly safe?
12. What is the advantage of more widely public transportation in big cities?

**Ex. 4. Read the article and write the names of the devices in the chart**

Robot Murata Boy weighs less than 5 kg and is only 508 mm tall, but it can do something that no other robot can do. It can ride a bike. How does it do this? By means of sensors and wireless technology.

One sensor is located in the robot's body. This sensor keeps the robot upright and prevents it from falling sideways. The robot can look ahead using a small camera in its head. The camera helps the robot to ride in a straight line.

Another sensor is located in its chest. This sensor prevents it from hitting a wall or other object. The robot can receive instructions from an external computer by means of a wireless receiver in the box on its back. The computer makes it follow the correct road.

Finally, if the road is not flat, another sensor, in the frame of the bike, can feel the movement of the wheel. The sensor allows the robot to ride over bumps in the road.

Murata Boy can do these things	Device	Location
1. It can stay in a vertical position on the bike	sensor	body
2. It can receive instructions from an outside computer		
3. It can detect changes in the surface of the road		
4. It can look straight ahead and move straight forward		
5. It can detect walls and move away from them		

**Ex. 5. Translate the following sentences into English**

1. Перша мережа метрополітену з'явилась у Лондоні в 1863 році.
2. Автобуси мало вимогливі до траси, рухаються звичайними дорогами, а автобусні зупинки дешеві в обслуговуванні.
3. Основними засобами пересування в Україні у 90-х роках були автобуси, тролейбуси і трамваї.
4. Платна дорога – це автомобільна дорога, за проїзд якою водії мають заплатити.
5. Пасажирський транспорт об'єднує масовий суспільний транспорт, що перевозить пасажирів за визначеними маршрутами.
6. Оплата за швидкісні дороги передбачає покриття витрат на будівництво та утримання доріг.
7. Трамваї мають більшу місткість, ніж автобуси, але потребують постійного догляду за інфраструктурою.
8. В Україні прокладання нових трас є доречним поряд із наявними дорогами за рахунок інвесторів, які в свою чергу будуть отримувати дохід.
9. Якщо ви їдете по великому незнайомому місту, то випадково можете пропустити потрібний поворот на великому транспортному вузлі.

10. Пором – це човен або корабель, який використовується для перевезення пасажирів, а інколи і їхніх транспортних засобів, через водоймища.

11. Платні дороги існували з давніх часів, коли мито стягувалося з мандрівників, що подорожували на возі, верхи або і пішки.

12. Залізничний транспорт є галуззю промисловості, частиною транспортної мережі логістичних ланцюгів, які сприяють міжнародній торгівлі й економічному зростанню.

***Ex. 6. Prepare reports using Internet or other sources (catalogues, magazines, books, etc.) about the latest news, achievements in the field concerning the topic of the unit***

## UNIT 3

### AUTOMOBILE ENGINEERING

#### ***Ex. 1. Learn the vocabulary***

ambulance – авто швидкої допомоги

application – застосування

axle – вісь

combustion [kəm'bestʃ(ə)n] – горіння, згоряння

convertible – автомобіль з відкидним дахом

cylinder ['silində] – циліндр, валик, барабан

deal with – мати справу з

fuel – паливо

heavy transport vehicle – вантажівка для перевезення важкого вантажу

internal combustion engine – двигун внутрішнього згорання

light motor vehicle – легкове авто

sedan [si'dæn] – седан (тип кузова)

station wagon – універсал

petrol – бензин

#### ***2. Read and translate the text***

Automobile engineering is the one of the stream of mechanical engineering. It deals with various types of automobiles, their mechanism of transmission systems and its applications. Automobiles are the different types of vehicles used for transportation of passengers, goods, etc.

Basically all types of vehicles work on the principle of internal combustion processes or some times the engines are called as internal combustion engines. Different types of fuels are burnt inside the cylinder at higher temperature to get the transmission motion in the vehicles. Most of the automobiles are internal combustion engines vehicles only. Therefore, every mechanical and automobile engineer should have the knowledge of automobile engineering, its mechanisms and its various applications.

Automobile can also be defined as a vehicle which can move by itself. For example cars, jeeps, buses, trucks, scooters, etc.

Automobiles or vehicles can be classified on different bases as given below.

On the basis of load:

- heavy transport vehicle or heavy motor vehicle (trucks, buses, etc.);
- light transport vehicle (pick-ups, station wagons, etc.);
- light motor vehicle (cars, jeeps, etc.).

On the basis of wheels:

- two wheeler vehicle (scooter, motorcycle, scooty, etc.);
- three wheeler vehicle (auto rickshaw, three wheeler scooter, etc.);
- four wheeler vehicle (car, jeep, trucks, buses, etc.);
- six wheeler vehicle (big trucks with two gear axles each having four wheels).

On the basis of fuel used:

- petrol vehicle (motorcycle, scooter, cars, etc.);
- diesel vehicle (trucks, buses, etc.);
- electric vehicle (battery drive );
- steam vehicle (an engine which uses steam);
- gas vehicle.

On the basis of body:

- sedan with two doors;
- sedan with four doors;
- station wagon;
- convertible (e.g. jeep, etc.);
- van;
- special purpose vehicle (ambulance, milk van, etc.).

***Ex. 3. Answer the following questions***

1. What does automobile engineering deal with?
2. What is the purpose of automobiles?
3. What is the principle for working of all types of vehicles?
4. What is necessary to get the transmission motion in the vehicles?
5. What kind of engine is the most popular?
6. What types of vehicles do you know?
7. How are automobiles classified?
8. Give examples of automobiles with three wheels.
9. What is the difference between diesel vehicle and electric vehicle?
10. How is vehicle with a steam engine called?
11. Give examples of automobiles according to their body.
12. What are vehicles for special purpose?

***Ex. 4. Put the words in the correct order***

- 1) have, many, they, how, got, trucks and buses?
- 2) types, are, the, automobiles, different, vehicles, of?
- 3) types, of, different, are, fuels, burnt, the, inside, cylinder?
- 4) used, cars, for, are, of, transportation, passengers?
- 5) knowledge, should, engineer, have, the, of, engineering, automobile?
- 6) what, fuel, is, kind, the, of, popular, most?
- 7) motorcycles, scooters, popular, are, and, teenagers, among?
- 8) combustion, of, the, automobiles, most, are, internal, vehicles, engines?

***Ex. 5. Translate the following sentences into English***

1. Усередині циліндра спалюються різні види палива.
2. Автомобілі спеціального призначення існують в кожній країні.
3. Джон вважає, що дизельне паливо більш дешеве, ніж бензин.
4. Автобуси застосовуються для перевезення пасажирів.
5. Автомобілі класифікуються на основі різних принципів.

6. Декілька днів тому Мері купила автомобіль із відкидним дахом.
7. Вантажівки для перевезення важкого вантажу є дуже популярними в нашій країні.
8. Кожен інженер-механік повинен мати знання із автомобільної інженерії.
9. Сьогодні у світі налічується більше десятка тисяч транспортних засобів.
10. Більшість транспортних засобів використовує двигун внутрішнього згорання.
11. Автомобіль – це вид транспортного засобу для здійснення різних перевезень.
12. Автотранспортні засоби – це транспортні засоби, які рухаються на колесах по дорогах за допомогою власного двигуна.

***Ex. 6. Prepare reports using Internet or other sources (catalogues, magazines, books, etc.) about the latest news, achievements in the field concerning the topic of the unit***

## UNIT 4

### AUTOMOTIVE INDUSTRY IN UKRAINE

#### ***Ex. 1. Learn the vocabulary***

- acceptable wages – прийнятлива заробітня плата  
acoustics [ə'ku:stɪks] – акустика  
automotive industry – автомобільна промисловість  
beyond [bɪ'jɒnd] – поза, за межами  
car cover – авто чохол  
Carpathian [kə'reɪθiən] – Карпатський  
Chinese [tʃaɪ'ni:z] – китайський  
Daimler ['daɪmlɚ] – Даймлер, один з провідних світових автовиробників, Німеччина  
defense industry – військова індустрія  
desire [dɪ'zaɪə] – (палке) бажання  
engine [endʒɪn] – двигун  
enterprise customers – корпоративні клієнти  
European [ju(ə)rə'piən] – європейський  
in charge of – відповідальний за  
Japanese [dʒæpə'ni:z] – японський  
Mercedes [mɛr'tse:dəs]  
on-board cabling – вбудований кабель  
Porsche [pɔʃ]  
prestigious [pre'stɪdʒəs] – престижний  
proximity – доступність  
released – випущений, допущений  
rely on – покладатися на  
speakers – колонки  
the like – тому подібне  
wiring [waɪ(ə)rɪŋ] – електропроводка, обмотка

#### ***Ex. 2. Read and translate the text***

Ukraine has become an attractive platform for manufacturers of automotive components. Acceptable wages and proximity to carmakers in Europe are good arguments for investors. In fact, there are about 20 companies that have been already working in the world of automotive industry in our country. Moreover, during the next few years it would be possible to see a few plants of international manufacturing.

Basically Ukrainian workers rely on the production of the simplest products – car covers, wiring and the like. However, Ukraine is responsible for more complex components either. For example, electronics, engine components, sys-

tems, climate control and heating are of great popularity.

The major part of the enterprises owned by foreigners are mostly Chinese and Japanese ones. But there are also local companies that have managed to establish contacts with European car factories.

International companies that have started the production of automotive components in Ukraine, rarely go beyond the Carpathian region. Their favourite locations are Lviv and Ivano-Frankivsk.

In general the geography of production is concentrated due to the desire to be closer to our customers in Europe. Although there are some companies that have chosen the place for the construction of the plant based on the economic characteristics – some plants have been built in the area, where the beginning of the 2000s was considered to be so-called free economic zones.

Ukraine is a favourite place for on-board cabling manufacturers for cars. Among manufacturers of automotive cables for cars and Ukrainian companies there is an enterprise “Production Association “Karpaty”. The company belongs to the state. Moreover, it is the part of the national holding company structure in charge of the defense industry – “UkrOboronProm”. The Ukrainian defense industry is operated on such concerns as Volkswagen and Daimler, that are supplied with the Carpathian cables.



Another Ukrainian producer, released on the European market is Mukachevo plant “Tochprilad”. In addition to automotive wiring this company produces speakers which are established by international car manufacturers. For example, the acoustics, which is produced in Mukachevo, can be found on vehicles such as the Land Rover and BMW.

In a small town Vinogradov in Zakarpattia there is the factory of German Automotive Systems. This company produces electronic seat heating system for the prestigious brands of cars. Among the Ukrainian enterprise customers there are: BMW, Porsche, Mercedes and Ferrari.

### ***Ex. 3. Answer the following questions***

1. Why has Ukraine become an attractive platform for manufacturers of automotive components?
2. How many companies are specialised in automotive industry in our country?



3. What do the Ukrainian workers rely on in manufacturing?
4. Do Ukrainian workers specialise only on the manufacturing of simple products?
5. Which complex components are of great popularity?
6. What countries does Ukraine cooperate with?
7. Where is the main location of international companies for automotive production?
8. Who does a production association “Karpaty” belong to?
9. What is the Ukrainian defense industry operated on?
10. What is “Tochprilad” famous for?
11. Where is the factory of German Automotive Systems situated?
12. Who are electronic seat heating systems of German factory intended for?

**Ex. 4. Guess the word from the text due to the certain description. Make up your own sentences using the guessed words**

1. A place where an industrial or manufacturing process takes place (5 letters).
2. A person who does a specified type of work (6 letters).
3. The brand of high-quality sport and racing cars, named after Italian designer (7 letters).
4. A system of wires providing electric circuits for a device or building (6 letters).
5. A thing used for transporting people or goods, especially on land, such as a car, lorry or cart (7 letters).
6. A machine designed to convert one form of energy into mechanical energy (6 letters).
7. The synonym for “plant” (7 letters).
8. Its capital is Kyiv (7 letters).
9. An insulated wire used for transmitting electricity or telecommunication signals (5 letters).
10. Equipment installed in a car or other vehicle to provide in-car entertainment and information for the vehicle occupants (8 letters).

**Ex. 5. Translate the following sentences into English**

1. Серед корпоративних клієтів є заводи Мерседес та Феррарі.
2. Україна співпрацює із Німеччиною та Японією.
3. Компанія “Карпати” належить державі.
4. Автомобіль VW оснащений кабелями, виробленими в Карпатах.
5. Компанія виробляє підігрівну систему для сидінь для автівок відомих марок.
6. Через декілька років можна буде побачити нові заводи з міжнародного виробництва.
7. Місцевим компаніям вдалося встановити взаємовідносини з Європейськими автомобільними заводами.

8. Виробники автомобілів з інших країн вкладають гроші у розвиток автомобільної промисловості України.

9. Її чоловік працює на заводі в Мукачеві, який виробляє системи клімат контролю.

10. Для іспиту студентці потрібно було знати інформацію про компоненти двигуна.

11. Автомобільна промисловість України охоплює компанії, що беруть участь у проектуванні, розробці, виробництві, маркетингу та продажу автомобілів.

12. Невисока якість та низька купівельна спроможність населення сприяють завою автомобілів, які уже були у використанні і термін використання яких уже вичерпаний.

***Ex. 6. Prepare reports using Internet or other sources (catalogues, magazines, books, etc.) about the latest news, achievements in the field concerning the topic of the unit***

## UNIT 5

### THE FUTURE OF THE AUTOMOBILE INDUSTRY

#### **Ex. 1. Learn the vocabulary**

“just-in-time” manufacturing – виробництво за принципом “дуже вчасно”  
annual sales – щорічні продажі  
China [ˈtʃaɪnə] – Китай  
competition [kəmˈpiːtɪʃ(ə)n] – конкуренція  
consumer confidence – споживча довіра, очікування  
conventional – звичайний  
domestic market – вітчизняний ринок  
emissions – викиди  
freight companies – транспортні компанії  
Fuel Cells – паливний елемент  
GM – General Motors  
GPS – Global Positioning System, всесвітній навігаційний комплекс, що базується на отриманні сигналів від масиву орбітальних супутників  
impact – вплив  
joint ventures – сумісні підприємства  
nonrenewable – невідновлювальний  
overseas companies – зарубіжні компанії  
propulsion [prəˈpelʃ(ə)n] – рух уперед, рушійна сила  
saturated [ˈsætʃəreɪtɪd] – насичений  
slow down – уповільнювати  
take stock – робити інвентаризацію  
telematics [teliˈmætiks] – телематика  
Toyota-Prius [ˈpriːəs]  
virtually [ˈvɜːtʃʊəli] – фактично, практично, у дійсності

#### **Ex. 2. Read and translate the text**

Sixty million cars and trucks are made every year, but in many parts of the world, the market seems to be saturated. Car sales in the US, for instance, are slowing down due to rising of oil prices and a lack of consumer confidence. Both GM and Ford are cutting production in their domestic market. US car makers are also facing intense competition from overseas companies – last year, Toyota overtook Ford to become the world’s number two producer.

Toyota, which led the way in “just-in-time” manufacturing techniques, has raised its annual sales forecast. Both European sales and US sales have increased. Meanwhile, industry eyes are focused on China, where the boom continues. As new investment continues, and western companies set up joint ventures with Chinese manufacturers, the government has just forecast that the country could have 140 million automobiles on its roads by 2020 – seven times

more than now.

So what does the future for car makers hold? There is great interest in Toyota-Prius. This hybrid electric car has achieved sales of over 200,000, offering one possible solution for reducing polluting emissions in the future. It is with the electric motor running the car in slow traffic and a conventional petrol engine running the car on the open road. At some point, the car industry will be forced to take stock of the effect of the oil crisis, and consider alternative, environmentally friendly ways of powering vehicles.

With interest in “back seat” entertainment such as digital movies, it may be that technology could help turn around the car industry. “Telematics” is making a huge impact in commercial vehicles, allowing foreign companies to track the position of lorries using on-board GPS systems.

There is another new technology called “Fuel Cells” that should be available by the end of the decade that will eliminate our dependence on non-renewable resources.

Fuel cells convert hydrogen and oxygen to electricity without going through a combustion process; thereby virtually eliminating emissions. They also operate at much higher efficiencies than internal combustion engines, producing double the amount of energy.

Most of the world’s auto manufacturers have a fuel cell project in progress and virtually all of them agree that fuel cells are the propulsion system of the future. Everyone is happy having, for example, a mid-sized sedan with all the trimmings and power that we enjoy today, with the ability to deliver upwards of 100 miles per gallon.

***Ex. 3. Answer the following questions***

1. How many cars are produced per year?
2. What is the reason of car sales decreasing in the US?
3. What car companies are considered to be rival?
4. Why do western companies set up joint ventures with Chinese manufacturers?
5. What is the forecast as for the manufacturing of automobiles by 2020?
6. What is the best solution for reducing polluting emissions from cars in big cities?
7. What digital entertainment is widely spread among “back seaters”?
8. What is the name of the system to track the position of lorries?
9. What new technology will be available by the end of the decade?
10. In what way are hydrogen and oxygen converted?
11. What do the world’s auto manufacturers call the propulsion system of the future?
12. What is special in a mid-sized sedan?

**Ex. 4. Match the beginning of the sentences with their endings**

1. Tom is so excited driving this car,	a) that yesterday, on the motorway, he didn't notice his best friend, that was greating him from his car.
2. Very often he drives fast and	b) need an ignition key to start, only a magnetic card.
3. I understood everything when he	c) set up joint ventures with Chinese manufacturers.
4. I am afraid that the amount of the fuel	d) up, you change your gear.
5. Paul bought a new car that doesn't	e) back parts of a car are the bampers.
6. One of these was a dangerous over-taking	f) tries to overtake other cars.
7. For him, changing a gear is very exciting,	g) and "petrol" in England.
8. The front and	h) and two others were exceeding the speed limits.
9. When you add power to speed	i) so he didn't want an automatic transmission.
10. Car fuel is called "gas" in America	j) is going to run out soon.
11. Western companies	k) explained me how powerful his car was.

**Ex. 5. Translate the following sentences into English**

1. Гібридні автівки стали дуже популярними.
2. Продаж автомобілів уповільнився через підняття цін на паливо.
3. У Китаї все ще продовжується бум в автомобільній промисловості.
4. Вітчизняний ринок з виробництва автівок потрібно покращувати.
5. Тойота-Пріус стала другим світовим виробником автомобілів після Форду.
6. Серед вантажівок та автобусів застосування телематики є дуже актуальним.
7. Деякі експерти вважають, що ринок з виробництва автомобілей перенасичений.
8. Системи навігації застосовуються для відслідковування розташування вантажівок.
9. У 2020 році автівки без водіїв можна буде побачити у великих містах.
10. Зарубіжні компанії роблять величезний вплив на виробництво автомобілей у нашій країні.
11. Американські виробники автівок стикаються із конкурентністю з

боку іноземних компаній з виробництва транспортних заходів.

12. Якщо люди будуть їздити лише на метро та автомобілях без водіїв, то потреба в автомобілях скоротиться на 60%.

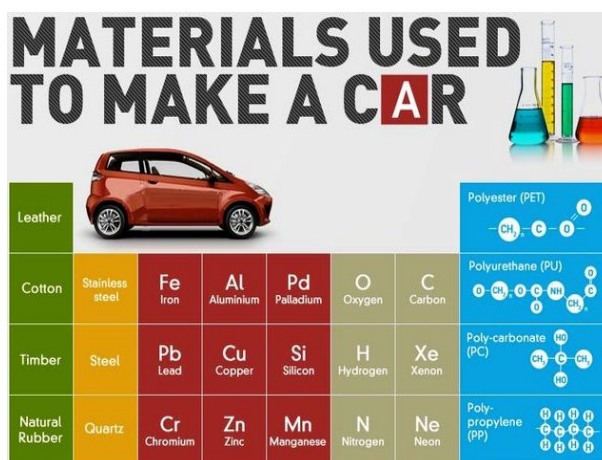
***Ex. 6. Prepare reports using Internet or other sources (catalogues, magazines, books, etc.) about the latest news, achievements in the field concerning the topic of the unit***

## UNIT 6

### MATERIALS FOR PRODUCTION OF AUTOMOBILES

#### *Ex. 1. Learn the vocabulary*

bonnet – капот  
 brittle – крихкий  
 corrosion-resistant – стійкий до корозії  
 dent-resistance – стійкість до вм'ятин  
 drawback ['drɔ:bæk] – недолік, вада  
 fabrics – тканина  
 fluid ['flu:ɪd] – рідина  
 front and rear axles – передня і задня осі  
 front wings – передні крила  
 implement – використовувати  
 launch – початок експлуатації  
 lead and copper – свинець та мідь  
 limousine ['lɪməzi:n, lɪmə'zi:n] – лімузин  
 lubricant ['lu:bri:kənt] – мастило  
 rigid ['rɪdʒɪd] – твердий, негнучкий  
 rust [rʌst] – іржавіти  
 tear – розривати  
 top-heavy – нестійкий



#### *Ex. 2. Read and translate the text*

The average car is made of a large number of different materials. Steel makes up the single largest percentage of materials, accounting for 55% of the car materials by weight. Then iron comes, with 13%. Plastics make up 10% of the car, although this percentage is naturally increasing all the time as car makers try to make vehicles lighter.

Aluminium accounts for 5% of the materials, although some cars contain much more. Some manufacturers are switching from steel to aluminium to save weight, because aluminium is so light. And new alloys mean that aluminium is now about as rigid as steel. Another advantage is that it's corrosion-resistant. It's going to be interesting to see if the popularity of aluminium continues to increase in the future.

Taking into consideration some other materials, it should be mentioned, that rubber accounts for 5% of the weight, and fluids and lubricants make up 4%. Zinc, lead and copper together accounts for 3%, and glass makes up 2%. All the other materials, including things like fabrics and ceramics, make up the final 3% together.

With the launch of the A2, Audi AG introduced the first vehicle in the world to have an all-aluminium body. In 1996, series production of the A8 began. The A8 is the luxury limousine made of aluminium. The car combines high strength with low weight. Other car makers are also starting to take aluminium seriously.

As engines sizes have increased, cars have become more top-heavy. Using aluminium for the bonnet and front wings helps to get a better weight distribution between front and rear axles. Another advantage of aluminium is that it is cheaper to recycle than steel.



But there are drawbacks to using aluminium. Replacing steel with aluminium is expensive. An aluminium body costs twice as much as a steel one. Not only aluminium production processes are expensive, they are also difficult to implement. As aluminium is more brittle and tears more easily than steel, it can only be formed when it is in an unhardened state. Furthermore, the aluminium used for outer parts of the car, such as the wings and the doors, needs to be thicker than steel because it doesn't have the same stiffness. The dent-resistance of aluminium is also less than that of steel.

On the plus side, aluminium doesn't rust like steel, and in car crashes it has a higher energy absorption rate, which increases the car's active safety.

**Ex. 3. Answer the following questions**

1. Which materials are mostly used in the manufacturing of cars?
2. Why do manufactures switch from steel to aluminium?
3. Is aluminium as brittle as steel?
4. Is aluminium subjected to corrosion?
5. Why has Audi AG become popular?
6. What is known about A8?
7. Why have cars become more top-heavy?
8. Speak about some advantages of aluminium.
9. What disadvantages of aluminium do you know?
10. Does an aluminium body cost twice less than a steel one?
11. When can aluminium be formed?
12. What increases the car's active safety?



# MATERIALS IN A CAR



**Ex. 4. Complete the sentences about materials and their properties with the given words. Use the dictionary if it is necessary**

*Light, flammable, durable, natural, elastic, rigid, malleable, shatterproof, heat-resistant, corrosion-resistant.*

1. Windscreens are made of a special \_\_\_\_\_ glass to protect drivers in accidents.
2. Aluminium is ideal for bumpers and other body parts because it is \_\_\_\_\_.
3. Safety regulations require that the foam used in car seats shouldn't be \_\_\_\_\_.
4. Fabrics use in cars need to be \_\_\_\_\_ and not look old too quickly.
5. Wood is very often used in interiors because it looks \_\_\_\_\_ and warm.
6. Aluminium and magnesium are important for car makers because they are \_\_\_\_\_ and therefore good for weight-saving.
7. Sheet metal is used for large car parts because it is \_\_\_\_\_ and dent-resistant.
8. Rubber should be able to withstand great temperature differences while staying \_\_\_\_\_. In other words, it shouldn't become brittle.
9. Ceramic, which is \_\_\_\_\_, is used in the catalytic converter because of the very high temperatures.
10. Steel is used for load-bearing parts because it is \_\_\_\_\_.

**Ex. 5. Translate the following sentences into English**

1. На сьогодні алюміній має таку ж жорсткість, як сталь.
2. Виробники автомобілів намагаються зробити більш легкі автівки.
3. Вчора вони їхали в розкішному лімузині, зробленому з алюмінію.
4. Автомобіль з алюмінієвим корпусом коштує у два рази більше, ніж автомобіль зі сталевим корпусом.
5. Алюміній не ржавіє так, як сталь.

6. Мідь, цинк та свинець входять до складу матеріалів, з яких виробляється автомобіль.

7. Коли розмір двигуна збільшився, то автомобілі стали більш нестійкими.

8. Алюміній можна формувати лише тоді, коли він знаходиться у незагартованному стані.

9. Однією з переваг алюмінію є те, що його дешевше переробляти, ніж сталь.

10. Для зовнішніх частин автомобілів переважно застосовується алюміній.

11. Вибір матеріалу – це відповідальний етап тому, що вірно вибраний матеріал визначає якість деталі та машини загалом.

12. Конструкторам необхідно весь час йти на компроміси, шукати нові технології, нові матеріали для легкості, міцності, безпеки і мінімальної вартості автомобіля.

***Ex. 6. Prepare reports using Internet or other sources (catalogues, magazines, books, etc.) about the latest news, achievements in the field concerning the topic of the unit***

## UNIT 7

### ADVANTAGES AND DISADVANTAGES OF CARS

#### ***Ex. 1. Learn the vocabulary***

availability – доступність

comparatively – відносно, порівняно

driving license – права водія

immature – незрілий, недорослий

irresponsible immature – невідповідальний

it is worth pointing out – варто зазначити

means of transport – транспортні засоби, засоби пересування

take into consideration – брати до уваги

there is no doubt – без сумніву

traffic jam – затор

urgency – негайність

waste – марно витратити

#### ***Ex. 2. Read and translate the text***

There are many different means of transport. Sometimes we can't imagine how people could live without cars, buses, trains and planes many years ago. Some people prefer travelling by car, others think that it's dangerous and pollutes the environment. Whatever your views, there is no doubt that travelling by car has both many advantages and disadvantages.

To begin with the speed, we can move quickly from one place to another. We don't have to waste our time. Possessing a car allows us to travel wherever and whenever you want. You can use a car in case of urgency, for example if you want to drive to the doctor you don't have to wait for a bus. Also you don't have to travel when timetable says you can. You can quickly move and you can travel from door to door.

Secondly, cars are always available and we can go by car everywhere. Sometimes in small villages buses travel very rarely. People have to wait for a long time to go to the town. Availability is the second advantage of travelling by car.

Moreover, we can also have touring holiday when and where we want. If we want to go for a trip, we don't have to book bus tickets – it's too complicated. If we have a car, we need only a map or GPS system and we can simply get into a car and go!

On the other hand, travelling by car is not very comfortable for a driver. He cannot relax; he has to be careful all the time. Vehicles are forced to stay in traffic jams, it is also very uncomfortable. Passengers can sleep or do what they want. When a driver is very tired, he can be as dangerous on the road as a drunk driver.

Travelling by car is dangerous too. There are many crashes on the roads and we should be very careful and sensible. There are many people, who want to drive after alcohol; they cause a lot of accidents. Unfortunately such people are irresponsible and immature. Furthermore, people who drink and drive should lose their driving license for life.

One more fact to take into consideration is that using a car is also very expensive. If you have a car you have to pay much money for petrol and services. Petrol prices are very high. A lot of people prefer to use gas more than petrol because gas is better for the environment. What is more, the gas is comparatively cheaper. Sometimes you can be stuck in a traffic jam, you have to pay for car park and petrol. Cars are less comfortable than trains. You can't sleep when you drive, you can't relax. Cars pollute the air more than trains.

To sum up, it is worth pointing out that if we have money and remember about politeness, patience and responsible driving even when we have problems with finding a parking space and we get nervous – we can enjoy driving for many years, for sure.

***Ex. 3. Answer the following questions***

1. How many kinds of transport are mentioned in this text and what are they?
2. Give any example of urgency case where the car would be the best means of transport.
3. Why is an automobile considered to be more available in comparison with other public transport?
4. What are advantages of possessing a car for people who live in villages?
5. What disadvantages can a driver face while driving a car?
6. What things can happen in case of uncareful driving?
7. Why do a lot of people prefer gas to petrol?
8. What things do we need to remember before buying an automobile?
9. Why is having a car very expensive?
10. Why is travelling by car less comfortable than by train?

***Ex. 4. Identify the devices from their descriptions***

1. This device sells rail or bus tickets to travellers. The traveller activates it by touching the screen.
2. This device sounds an alarm when an intruder enters a building. The burglar activates it by interrupting a laser beam.
3. This machine's located on the rear of a motorboat. The sailor starts it by pulling a handle. The handle is attached to a cord or cable.
4. This device makes a motorbike go faster. You activate it by twisting the handle on the handlebars.

***Ex. 5. Translate the following sentences into English***

1. Без сумніву, подорожувати автомобілем дуже цікаво.

2. На жаль, машини забруднюють повітря більше, ніж поїзди.
3. Іноді ви можете застрягти у «пробці».
4. Він хотів трохи поспати, але не міг, тому що керував автівкою.
5. Система GPS допоможе швидко знайти розташування міста.
6. За допомогою автомобіля можна швидко пересуватися з одного місця в інше.
7. Парковка у спеціально відведених для туристів місцях може бути дуже дорогою.
8. Багато людей надають перевагу використанню газоліну, тому що він не так забруднює повітря.
9. Варто зазначити, що люди, які випили спиртне, мають бути позбавлені водійських прав.
10. Коли нам необхідно їхати у подорож машиною, то не потрібно замовляти квитки.
11. Якщо у вас є автомобіль, то вам потрібно витратити багато грошей на бензин та обслуговування машини.
12. Ви заощадите гроші, якщо кількість пасажирів дорівнюватиме кількості посадочних місць автомобіля, адже квитки на поїзд і літак коштують набагато дорожче.

***Ex. 6. Prepare reports using Internet or other sources (catalogues, magazines, books, etc.) about the latest news, achievements in the field concerning the topic of the unit***

## UNIT 8

### THE ADVANTAGES OF GAS-POWERED CARS

#### ***Ex. 1. Learn the vocabulary***

appealing – привабливий  
average ['æv(ə)rɪdʒ] – середній, звичайний  
braking – гальмування  
by far – безперечно  
capacity – місткість, обсяг  
cite – згадувати  
conserve – зберігати  
convenience [kən'vi:niəns] – зручність  
conventional – звичайний, консервативний  
counterpart – аналог  
fossil fuel – природне паливо  
offset ['ɒfset] – відшкодувати, компенсувати  
option – предмет вибору  
refine – удосконалювати  
replacement – заміна

#### ***Ex. 2. Read and translate the text***

While most major automakers now produce at least one hybrid-electric vehicle, gas-powered cars still dominate the global market for automobiles. Environmental activists commonly cite this as a problem, since gasoline is a fossil fuel with limited supplies that produces harmful emissions when burnt. However, there are still several key advantages to buying or driving a gas-powered car.

*Cost.* While the price of the technology needed for hybrid cars continues to fall, conventional gas-powered cars still cost less than their newer counterparts. In part, this is due to high research and development costs needed to bring a new hybrid system to market whereas gas-powered cars use technology that has been around for more than a century and refined over the years.

Some hybrid models may also cost more to repair and maintain, especially if hybrid drive components, such as the electric motor or battery pack, require replacement. Depending on an individual driver's needs and long-term trends in the price of gasoline, the additional cost of a hybrid car may or may not be offset by its fuel savings.

In addition, hybrid cars are newer, so there are fewer used models available at any given time. This drives up their cost and makes used gas-powered cars even more appealing to drivers with limited budgets.

*Range.* Another key advantage of a gas-powered car is its range. For example, a car with a 20-gallon gas tank that achieves an average fuel economy of 20 miles per gallon can travel 400 miles before needing to be refueled. This is far more than the range of electric vehicles, which may use a small gas engine to

produce additional electricity and extend their range to make them practical for more drivers. Hybrid-electric cars will have a range that depends on how much energy they can conserve during braking but still often have less range than gas-powered cars due to limited battery capacity.

*Power.* Some hybrid-electric cars, especially early models, may compromise on power for better fuel efficiency. This is a result of carrying the added weight of the batteries as well as the limited output of an electric motor.

However, gas-powered cars continue to become more powerful even as they are refined to be more fuel efficient. Systems like displacement-on-demand, which allows a gas-powered car to shut off some of its cylinders to save gas under certain conditions, give drivers a combination of horsepower and efficiency.

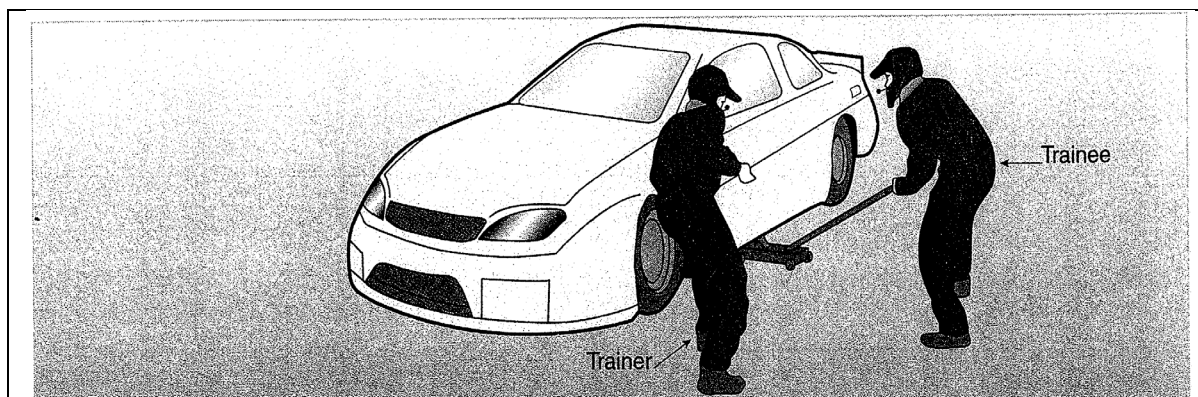
*Infrastructure.* One of the biggest advantages that gasoline cars have going for them is their infrastructure. The demand for gasoline requires drilling teams to locate petroleum, refineries that turn it into gas, trucks that deliver it and service stations that sell it. This constantly running machine means that people who have a gasoline-powered car don't have to look very far to find the fuel that they need, usually at a fairly common market price. People who drive alternative-powered vehicles may not have this convenience.

*Price.* Comparatively-speaking, gasoline-powered cars are by far the cheaper option on the market. Gasoline-powered cars cost thousands of dollars less than hybrid models, and even less than natural gas or fuel cell vehicles. The market is filled with gasoline-powered cars. Many people would be much more willing to buy a car at a lower price (especially if that car's parts can easily be purchased if repairs are needed) than they would be to buy a car at a much higher price (with potentially higher repair costs down the road).

***Ex. 3. Answer the following questions***

1. Where do gas-powered cars still dominate?
2. How can you describe fossil fuel?
3. What cars cost more nowadays?
4. How may the additional cost of a hybrid car be offset?
5. What does a range of hybrid-electric cars depend on?
6. Do gas-powered cars still dominate in your native city or town?
7. What is a result of better fuel efficiency?
8. In what way are systems like displacement-on-demand useful for drivers?
9. What is one of the biggest advantages of gasoline cars?
10. What kinds of cars represent the cheaper option on the market?
11. Do hybrid models cost thousands of dollars less than gasoline-powered cars?
12. Why would many people be much more willing to buy a car at a lower price?

**Ex. 4. You are a trainee pit-stop mechanic. A trainer is giving you instructions. Write numbers 1-10 to show the correct order of instructions**



- |  |
|--|
| a. Tighten the wheel nuts.               |
| b. Raise the car with the jack.          |
| c. Loosen the wheel nuts.                |
| d. Take the old wheel off.               |
| e. Take the old wheel away.              |
| f. Adjust the air pressure in the tyre.  |
| g. Bring the new wheel out.              |
| h. Put the new wheel on.                 |
| i. Put the jack under the car.           |
| j. Lower the car and take the jack away. |

**Ex. 5. Translate the following sentences into English**

- Газ дешевший, ніж бензин А-95 майже у два рази.
- Газ не містить сірки, яка руйнує масло.
- Літр газу в три рази дешевший, ніж літр бензину.
- Газ означає більш плавне згорання палива, а значить відсутність детонації.
- Газ не змиває масляну плівку зі стінок поршнів, що призводить до покращення ресурсів двигуна у 2 рази.
- Громіздкі балони для метану на вантажівках встановлені під днищем.
- У деяких регіонах недостатньо розвинена мережа газонаповнювальних станцій.
- Автомобіль на газу має конструктивне ускладнення паливної системи, що ускладнює ремонт і експлуатацію.
- Мережа газових заправних станцій недостатньо розвинена, порівняно з бензиновими АЗС.
- В автомобілях з газом можна зустріти також проблеми з роботою двигуна або запах газу в салоні.
- При експлуатації з денними пробігами по 300 км вартість автомобіля на газу окуповується протягом декількох місяців.



12. Екологи стверджують, що використання газового палива не тільки сприяє економії, а й зменшує викиди в атмосферу токсичних вихлопних газів.

*Ex. 6. Prepare reports using Internet or other sources (catalogues, magazines, books, etc.) about the latest news, achievements in the field concerning the topic of the unit*

## UNIT 9

### TIRE WEAR PATTERNS

#### *Ex. 1. Learn the vocabulary*

- adjust – регулювати
- afflict – турбувати
- alignment – вирівнювання
- bent – вигнутий, кривий, зігнутий
- camber wear – знос (малюнка) протектора, при неправильному куті розвалу коліс
- diagonal [daɪ'æɡənəl] – діагональний
- equalize – вирівняти
- excessive wear – надмірний знос
- linger – затриматись
- load rating – проектне навантаження
- molded-in – вилитий (сплав)
- moulded-in markings ['məʊldɪd] – відлиті маркування
- the National Highway Traffic Safety Administration (NHTSA) – Національна адміністрація з безпеки дорожнього руху, описує свою місію як «Збереження життя, запобігання травм, скорочення транспортних аварій»
- over-inflated – перекачаний, надутий
- patchy – неоднорідний
- pothole ['pɒθəʊl] – вибоїна, яма
- scalloping – нерівності
- spin – обертання
- suspension – підвіска
- tire ['taɪə] – ободок колеса, шина, покришка
- traction rating – коефіцієнт тяжіння
- under-inflated – недочута, недокачена
- wear and tear – експлуатаційне зношення

#### *Ex. 2. Read and translate the text*

Tires are an extremely important component of your car, and it's a good idea to check them periodically to see how they're faring. It's summer now, but the effects of winter may linger in your tires. Snow, salt, cold or fluctuating temperatures, and the winter potholes that often afflict roadways can all cause wear and tear. In fact, your car's tires have a story to tell, and if you want to determine how well the tires are doing, then you need to be able to understand what the tire wear patterns mean.



By closely examining the tires, you will be able to determine if the tire is wearing properly or if replacement should be considered. Below there are five common tire wear patterns you need to be aware of.

1. Excessive wear on the inner or outer edge of the tire, known as “toe wear” or, in more extreme cases, as “camber wear,” suggests something may be wrong with the wheel alignment. To fix the problem, you’ll likely need to make an appointment with a mechanic.

2. If the center of the tire is quicker to wear than the edges, then the tire is likely over-inflated. Read the information on the side of the tire to determine the proper tire pressure and adjust accordingly.

3. If the outer edges of the tire wear is faster than the center, the tire is likely under-inflated. Follow the tire pressure recommendation on the side of the tire, and add air to the tire as needed.

4. A diagonal scalloping on the tire, known as “cupping wear,” suggests the suspension may be worn, bent or somehow compromised. This is a serious concern, and you’ll probably need to make an appointment with a mechanic immediately.

5. Patchy wear implies the tire is out of balance. Have a mechanic spin and rotate your tires, as this will help equalize the wear. In the USA the National Highway Traffic Safety Administration suggests having tires spun and rotated every 5,000 miles, but it’s a good idea to consult your owner’s manual first.

Wear patterns aren’t the only things you can learn about from a close inspection of a tire. There are also markings and codes on the side of the tire that provide specific information, and this information is there to help you when it’s time to replace your tires. The moulded-in markings on the side of the tire include information about everything from the tire’s size and load rating to its temperature and traction rating.

All tires are also marked with a manufacturer’s date. The expected service life of a tire is roughly 10 years. If you’re buying new tires, be sure to check the manufacture’s date, as you never know how long a tire has been sitting in stock.

Whether tire wear patterns suggest something as simple as an over-inflated or under-inflated tire, or point to a more serious problem with the car’s suspen-

sion or alignment, by understanding what the tire wear patterns and molded-in markings mean, you'll be better able to determine the overall health of your car. After all, your tires are the only thing lying between your vehicle and the road. With these tips, you'll be well equipped to maintain your tires for life.

***Ex. 3. Answer the following questions***

1. Why is it a good idea to check your tires periodically?
2. What can cause wear and tear of your automobile after cold season of the year?
3. What is the reason of the wheel alignment?
4. How can you know if the tire is likely over-inflated?
5. In what case should you add air to the tire as needed?
6. What can help you to equalize the wear of tires?
7. Where can you find proper information when it's time to replace your tires?
8. Is the expected service life of a tire approximately ten weeks?
9. Why is it recommended to check the manufacture's date while buying new tires?
10. What extremely important components of an automobile can you mention?

***Ex. 4. There are several steps in the process of developing a car. Put the following steps in the correct order***

- a. A plant is set up to build the new model.
- b. Marketing teams work to promote the new model and the new car is launched.
- c. Researchers analyse the answers and suggest the type of car to be built.
- d. Engineers work to modify existing parts for the new model.
- e. Customers are asked questions about the sorts of features they would like in a car.
- f. Product planners make sure that the new car is ready on time.
- g. Tests are carried out in different conditions.
- h. A prototype is built.
- i. Designers work to design a new car based on these suggestions.

***Ex. 5. Translate the following sentences into English***

1. Автомобільні шини мають властивість не тільки виснажуватись, а й старіти.
2. З часом компоненти в складі шини змінюються і втрачають свої якості.
3. Тільки обережна і вдумлива їзда продовжить життя вашим покришкам.
4. Шини старіють швидше в дуже холодних або дуже жарких погодних умовах.

5. Атмосферна вологість, вентиляція, освітлення, температура та інші фактори значно впливають на якість зберігання і термін служби шини.

6. У травні 2013 року компанія “Bridgestone” виявила, що вісім із десяти автомобілістів Європи їздять на недокачаних шинах.

7. Безперечно, що термін служби шин залежить від навантаження, швидкості, прискорення, гальмування, тиску і якості утримання шин.

8. Шина виготовлена з безлічі матеріалів, якість яких впливає на робочі характеристики автомобільної шини.

9. Недостатньо накачана шина може лопнути при великій швидкості, зокрема на автомагістралі.

10. Різкий старт з місця, наїзд на перешкоди сприяють перегріву коліс та інтенсивно руйнують протектори.

11. Перед тим, як відправитись у відпустку, переконайтеся, що малюнок протектора не досяг індикатора зносу, а боковини не мають деформацій.

12. Камінчики, шматочки скла, цвяхи необхідно видаляти, щоб уникнути руйнування покриття.

***Ex. 6. Prepare reports using Internet or other sources (catalogues, magazines, books, etc.) about the latest news, achievements in the field concerning the topic of the unit***

## UNIT 10 HOW AN ENGINE WORKS

### *Ex. 1. Learn the vocabulary*

compression – стискання палива

compression ratio – коефіцієнт стискання

crankshaft ['kræŋkʃɔ:ft] – колінчастий вал

draw back – відсувати, відводити назад

exhaust – випуск відпрацьованих газів

expansion – зростання

four stroke engine – чотиритактний двигун

fuel-air mixture – паливно-повітряна суміш

ignite [ig'nait] – запалювати

intake – впуск

muffler ['meɪflə] – глушник

piston ['pɪstn] – поршень

plunger ['plendʒə] – штовхач (клапана), штифт

power – робочий хід

propel [prə'pel] – приводити в рух

revolution – оборот

spark plug – свічка запалювання

squeeze [skwi:z] – стискувати

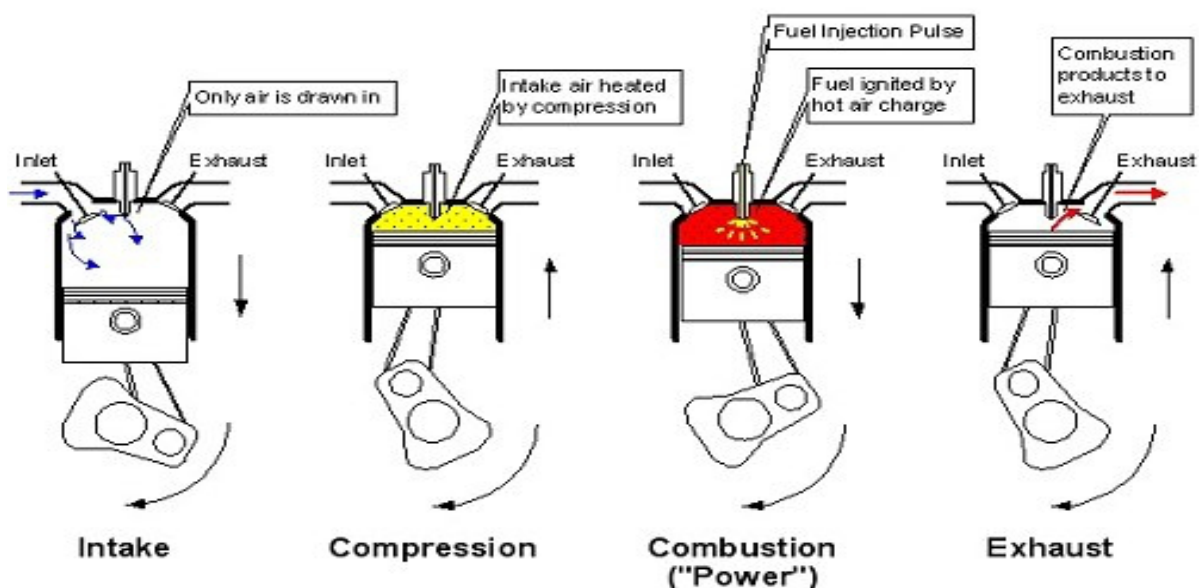
stroke – хід (поршня, клапана)

trap – затримувати

valve [vælv] – клапан, вентиль

vapour ['veɪpə] – пар

### 4-stroke Compression-ignition (Diesel) Engine Cycle



***Ex. 2. Read and translate the text***

Since the same process occurs in each cylinder, we will have a look at one cylinder to see how the four stroke process works.

The four strokes are Intake, Compression, Power and Exhaust. The piston travels down on the Intake stroke, up on the Compression stroke, down on the Power stroke and up on the Exhaust stroke.

*Intake.* As the piston starts down on the Intake stroke, the intake valve opens and the fuel-air mixture is drawn into the cylinder. When the piston reaches the bottom of the intake stroke, the intake valve closes, trapping the air-fuel mixture in the cylinder.

*Compression.* The piston moves up and compresses the trapped fuel-air mixture that was brought in by the intake stroke. The amount that the mixture is compressed is determined by the compression ratio of the engine. The compression ratio on the average engine is in the range of 8:1 to 10:1. This means that when the piston reaches the top of the cylinder, the air-fuel mixture is squeezed to about one tenth of its original volume.

*Power.* The spark plug fires, igniting the compressed air-fuel mixture which produces a powerful expansion of the vapor. The combustion process pushes the piston down the cylinder with great force turning the crankshaft to provide the power to propel the vehicle. Each piston fires at a different time, determined by the engine firing order. By the time the crankshaft completes two revolutions, each cylinder in the engine will have gone through one power stroke.

*Exhaust.* With the piston at the bottom of the cylinder, the exhaust valve opens to allow the burned exhaust gas to be expelled to the exhaust system. Since the cylinder contains so much pressure, when the valve opens, the gas is expelled with a violent force (that is why a vehicle without a muffler sounds so loud.) The piston travels up to the top of the cylinder pushing all the exhaust out before closing the exhaust valve in preparation for starting the four stroke process over again.

***Ex. 3. Answer the following questions***

1. What does the four stroke process consist of?
2. In what case does the intake valve open?
3. When is the air-fuel mixture trapping in the cylinder?
4. What is the amount of the compressed mixture determined by?
5. In what case is the air-fuel mixture squeezed to about one tenth of its original volume?
6. What is the role of the spark plug?
7. Why does a vehicle without a muffler sound so loud?
8. What is each piston's firing time determined by?
9. Is it an easy process to keep engines working well?
10. What is the reason of gas expelling with a violent force?

**Ex. 4. Match the part of the car with its function**

steering wheel	holds brake fluid
exhaust manifold	provides the power
radiator	stores electricity
fuel tank	ensures that the rear wheels turn at a different speed to each other when a car corners
brake line	produces electricity
silencer/muffler	sends an electric current to the spark plugs
battery	carries waste gases to the exhaust pipe
clutch	makes the car go faster when it is pressed
differential	used by the driver to turn the car
engine	holds fuel
brake cylinder	cools water from the engine
accelerator	connects the brake cylinder to the brakes
distributor	reduces the exhaust noise
alternator	disconnects the engine from the gearbox while the gears are changed

**Ex. 5. Translate the following sentences into English**

1. Двотактні двигуни при роботі виділяють більше диму.
2. Двотактний двигун важить менше ніж чотиритактний.
3. Чотиритактні мотори дуже популярні серед виробників мотоциклів.
4. Несправний двигун автомобіля – це наше життя і здоров'я.
5. При пуску холодного двигуна необхідна багата горюча суміш.
6. Чотиритактні двигуни мають складнішу конструкцію і коштують дорожче.
7. У 1889 році Готліб Даймлер збирає автомобіль, в основі якого лежить чотиритактний двигун.
8. Чотиритактний двигун не дуже шкідливий для здоров'я людини і менше забруднює навколишнє середовище.
9. У двотактному двигуні одного оберту колінчастого валу вистачає для завершення робочого циклу.
10. В автомобілях двигун захищений під капотом, а у мотоциклів зовнішній вигляд, дизайн двигуна має важливе значення.
11. Перший чотиритактний двигун, придатний до практичного використання, створив німецький інженер Ніколаус Отто у 1876 році.
12. Робочі цикли більшості автомобільних двигунів здійснюються за чотири такти, тому ці двигуни називаються чотиритактними.

**Ex. 6. Prepare reports using Internet or other sources (catalogues, magazines, books, etc.) about the latest news, achievements in the field concerning the topic of the unit**



## UNIT 11

### OILING SYSTEM. ENGINE COOLING. DEFROST SYSTEM CONTROL

#### **Ex. 1. Learn the vocabulary**

camshaft – розподільний вал

combustion [kəm'bestʃ(ə)n] – згоряння

coolant ['ku:lənt] – мастильно-охолоджувальна рідина

cranking – повертати, запускати

de-ice – дефростер

embedded [im'bedid] – вмонтований

emerge [i'mɜ:dʒ] – з'являтися

gauge [geɪdʒ] – індикатор, датчик

gear [giə] – механізм, привід, шестерня, зубчасте колесо

humidity [hju:'mɪdɪti] – вологість, ступінь вологості повітря

internal – внутрішній

leak – витік

moisture ['mɔɪstʃ(ə)] – вологість

oil pan – масляний піддон

rear windshield – задній обігрівач

self-destruct – самоліквідуватися

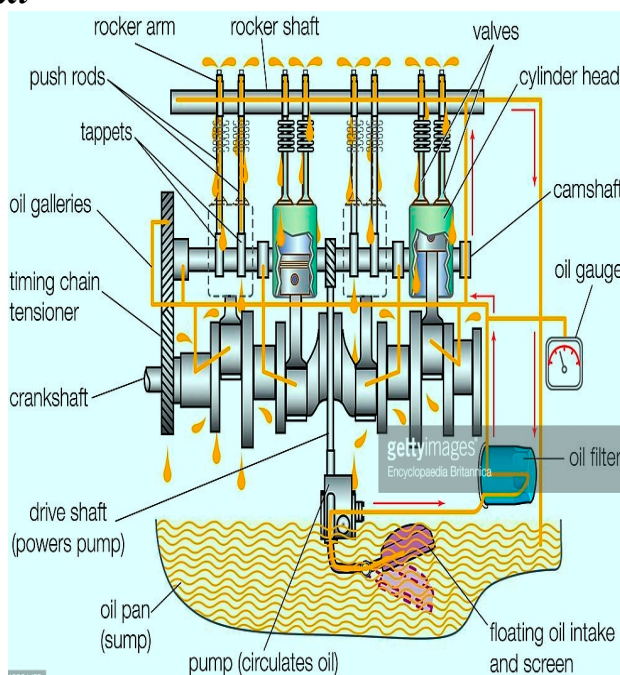
vent – вентиляційний отвір

warp [wɔ:p] – деформуватися

windshield defroster – обігрівач вітрового скла

#### **Ex. 2. Read and translate the text**

*Oiling System.* Oil is the life-blood of the engine. An engine running without oil will last about as long as a human without blood. Oil is pumped under pressure to all the moving parts of the engine by an oil pump. The oil pump is mounted at the bottom of the engine in the oil pan and is connected by a gear to either the crankshaft or the camshaft. This way, when the engine is turning, the oil pump is pumping.



There is an oil pressure sensor near the oil pump that monitors pressure and sends this information to a warning light or a gauge on the dashboard. When you turn the ignition key on, but before you start the car, the oil light should light, indicating that there is no oil pressure yet, but also letting you know that the warning system is working. As soon as you start cranking the engine to start it, the light should go out indicating that there is oil pressure.

*Engine Cooling.* Internal combustion engines must maintain a stable operating temperature, not too hot and not too cold. With the massive amounts of heat that is generated from the combustion process, if the engine did not have a method for cooling itself, it would quickly self-destruct. Major engine parts can warp causing oil and water leaks and the oil will boil and become useless.

While some engines are air-cooled, the vast majority of engines are liquid cooled. The water pump circulates coolant throughout the engine, hitting the hot areas around the cylinders and heads and then sends the hot coolant to the radiator to be cooled off.

*Defrost System Control.* With a flick of your wrist you send a stream of warm, dry air over the inside of the windshield to remove the condensation and improve visibility of the road ahead. The defrost controls are part of the heating and air conditioning system, usually located in the centre of the dashboard. The vents for the defrost system are aligned under the windshield. Rear windshields have de-ice / defrost wires embedded in them.

Warm air is blown across the windshield to evaporate the condensate that fogs your vision. Warm air holds more moisture than cold air so air is warmed before being blown out the vents. However, before the air is warmed, it is cooled. Does that make sense? Let us see.

Cold air can hold less moisture than warm air, so cooling the air first through the air conditioning system reduces the amount of water in the air. Cooling reduces the humidity before the air is warmed so it emerges with very low vapour content and a high capacity to absorb water vapour. Air is forced out of vents so it moves along the interior side of the windshield and the driver's and front passenger's windows. Heating wire embedded between sheets of glass in the rear windshield clears the fog there. Electrical current passing through the wires heats them, which melts snow and ice on the outside and clears away any interior fog. These defrost systems are operated by a separate control and shut off automatically.

***Ex. 3. Answer the following questions***

1. Can an engine run without oil?
2. Where is the oil pump located in a car?
3. What is the role of an oil pressure sensor?
4. How can you know that there is no oil pressure?
5. In what case will an engine quickly self-destruct?
6. When will the oil boil?
7. What is the role of coolant?

8. Where is the defrost system usually located in a car?
9. Why is air warmed before being blown out the vents?
10. What systems in a car are shut off automatically?
11. In what way are defrost systems operated?
12. What is the role of heating wire embedded between sheets of glass in the rear windshield?

**Ex. 4. Here is a newspaper article reviewing a new small family car. Fill in the blanks with the given words. The first letter is given to help you**

*Power assisted steering, alarm, electric, alloy wheels, tests, central locking, desert, advanced braking system, family, mini, air conditioning, immobilizer, airbags, van, sunroof, people carrier.*

Launched soon after their competitor's failure, the new LOTE A1 is the perfect car for Mum, Dad and two kids. Just back from its (a) t\_\_\_\_\_ in the heat of the (b) d\_\_\_\_\_ and the cold of the Arctic, the LOTE is the perfect small (c) f\_\_\_\_\_ car. The interior is classy and comfortable with surprisingly good leg room in the back. The (d) a\_\_\_\_\_ c\_\_\_\_\_ is highly efficient for the heat of summer, but if you prefer the carefree image, you can open the (e) s\_\_\_\_\_. There should be no arguments about how far to open the windows as the driver has full control of the (f) e\_\_\_\_\_ windows in the back, and of course, (g) c\_\_\_\_\_ l\_\_\_\_\_ saves telling the kids to lock their doors.

Driving this little beauty is a real pleasure. (h) P\_\_\_\_\_ a\_\_\_\_\_ s\_\_\_\_\_ makes those corners easy and the (i) a\_\_\_\_\_ b\_\_\_\_\_ s\_\_\_\_\_ will stop you comfortably in those tight moments. Safety is also high on the agenda here with fitted (j) a\_\_\_\_\_ for the front passenger as well as the driver. A car (k) a\_\_\_\_\_ is fitted as standard and an (l) i\_\_\_\_\_ will prevent someone starting the car without your permission.

It's a great-looking vehicle, bigger than the (m) m\_\_\_\_\_, less roomy than the (n) p\_\_\_\_\_ c\_\_\_\_\_ but faster than (o) v\_\_\_\_\_! With aluminium (p) a\_\_\_\_\_ w\_\_\_\_\_ and a price that's less than anything else in this range, it's one that's hard to beat.

**Ex. 5. Translate the following sentences into English**

1. Двигун працює нормально тільки при певному тепловому режимі.
2. Тиск масла в системі необхідно постійно контролювати.
3. У двигун можна заливати масло, яке рекомендоване заводом.
4. При зниженому тиску необхідно перевірити рівень масла.
5. Замінювати масло в піддоні двигуна необхідно одразу ж після роботи при добре прогрітому двигуні.
6. Якість і стан масла дозволяє звести до мінімуму зношування деталей автомобіля.
7. Якщо двигун переохолоджений, то збільшуються втрати тепла під час перетворення його в механічну енергію.

8. Висока працездатність системи мащення – це одна з головних умов надійності й довговічності двигуна.

9. Для нормальної роботи системи мащення рекомендується щодня перевіряти рівень масла в піддоні непрацюючого двигуна.

10. Система охолодження підтримує найкращий тепловий стан двигуна в межах 95°C, коли зайве тепло передається навколишньому повітрю.

11. Комбінована система мащення складається з пристроїв для очищення і охолодження масла.

12. Масла, що застосовуються в системі змащення можуть бути мінеральними, напівсинтетичними і синтетичними.

***Ex. 6. Prepare reports using Internet or other sources (catalogues, magazines, books, etc.) about the latest news, achievements in the field concerning the topic of the unit***

## UNIT 12

### HIGH-TEMPERATURE ELECTRONIC MATERIALS

#### ***Ex. 1. Learn the vocabulary***

adjust – регулювати  
airflow meter – вимірювач витрат повітряного потоку  
alternator ['ɔ:lternətə] – генератор змінного струму  
anti-lock system (ABS) – антиблокувальна система  
anti-skid braking – протиковзке гальмо  
collision avoidance system – система запобігання (уникнення) зіткнення  
cruise control – круїз-контроль  
drive-by-wire control system – система управління за допомогою дроту  
electronic steering – електронне управління кермом  
electronic transmission control – електронний контроль передачі  
fuel cell controller – регулятор паливних елементів  
fuel injection – вприскування палива  
power switching – перемикання живлення  
powertrain management – керування трансмісією  
reliability – надійність  
suspension – підвіска  
throttle – дросель, дросельний клапан  
traction control – контроль тяги  
window raiser – склопідійомник  
wiring multiplexed communications system – монтаж мультиплексної системи зв'язку

#### ***Ex. 2. Read and translate the text***

The modern automobile relies heavily on advanced electronic systems for vehicle performance and control, performing functions such as fuel injection and emission control, anti-skid braking, active suspension and electronic transmission control.

A recent study by Freedonia group has estimated that the growth for automotive electronics alone increased from \$1208 per vehicle in 1999 to \$1864 per vehicle in 2009. While some of this increase is due to the evolution of telematic systems, most of this growth will be due to hybrid vehicle electronics, collision avoidance and protection systems, electronic steering and vehicle stability, and powertrain management with the incorporation of new systems. Among them are drive-by-wire control systems (throttle, steer, brake and suspension by wire), collision avoidance systems (automatic braking, steering and throttling with radar), and advanced energy systems (fuel cell controllers and advanced energy converters).

Lightweight, functional and novel materials will increase the use of vehicle electronics systems to an unprecedented level. This unprecedented technological growth in automotive electronics is best illustrated by the evolution of one par-

ticular subsystem – powertrain management. Modules like voltage regulators, airflow meters and power switching help the electronic control systems to monitor powertrain performance and adjust mechanical operations. This trend to smart sensing, processing, switching and driving provides vehicle suppliers with two strategies for the overall systems electronics.

One option is to develop a very complex powertrain controller module capable of monitoring and adjusting a large number of inputs and outputs in real time. This option is becoming increasingly difficult as systems require more feature content. Another, more attractive option is to create a number of smart powertrain modules each performing a series of specific operations.

Many companies are now moving to these types of systems, which use a series of “mechatronic modules”. Electronic systems in a modern automobile include engine and power train electronic fuel injection, cruise control, anti-lock system (ABS), traction control, climate control, seat adjustment, electric window raisers, door lock control, wiring multiplexed communications system, starter, alternator, audio navigation system, sound system, mobile telephone-television internet access.

Demands on the reliability of the high temperature electronics component should not be ignored – most car manufacturers demand components that last the lifetime of the vehicle, which is not insignificant. Nevertheless, since the total available automotive electronics market is so large, more than \$14 billion per year, even a small part of this represents a large market to high temperature electronics providers. The required lifetimes for electronic components in automotive applications range from typically 5000 hours for passenger cars to 20,000 hours for commercial vehicles.

***Ex. 3. Answer the following questions***

1. What functions do advanced electronic systems perform?
2. What does collision avoidance system consist of?
3. What materials will increase the use of vehicle electronics systems?
4. What is the essence of powertrain management?
5. Why is option for developing a complex powertrain controller module difficult?
6. Are many companies moving to the types of systems, which use a series of “mechatronic modules” now?
7. Enumerate electronic systems in a modern automobile.
8. What is the demand of car manufactures?
9. Is it a good idea to ignore demands on the reliability of the high temperature electronics component?
10. What is the required lifetime for electronic components in automotive applications?
11. If you had a chance, what car would you buy – Dodge Viper SRT10 or Nissan GT-R? Why?
12. How large is the total automotive electronics market?

**Ex. 4. Decide if the following sentences are true (T) or false (F)**

1. The modern automobile refuses heavily from advanced electronic systems.
2. The growth for automotive electronics increased from \$1209 per vehicle in 1999.
3. Voltage regulators and power switching don't help the electronic control systems to adjust mechanical operations.
4. The trend to smart sensing, processing, switching and driving provides vehicle suppliers with several strategies for the overall systems electronics.
5. Many companies moved to these types of systems, which use a series of "mechatronic modules".
6. Total available automotive electronics market is very large.
7. Old automobiles include electronic systems with cruise control, anti-lock system, traction control, climate control, seat adjustment, door lock control, audio navigation system.
8. Most car manufacturers demand components that last the lifetime of the vehicle.

**Ex. 5. Translate the following sentences into English**

1. Автомобільна промисловість, зазвичай, розвивається дуже швидко.
2. Усі автомобілі 1999 року повинні мати кондиціонер або клімат-контроль.
3. Сучасний автомобіль сильно залежить від сучасних електронних систем.
4. Надійність компонентів високотемпературної електроніки не має ігноруватися.
5. Інший варіант цього авта охоплює електронний клімат-контроль та доступ в інтернет.
6. Технологічний ріст автомобільної електроніки найкраще проілюстровано розвитком однієї підсистеми.
7. Електронні системи сучасного автомобіля виконують такі функції, як: впорскування палива, контроль викидів та протиковзке гальмування.
8. Легкі, функціональні та нові матеріали збільшать використання електронічних систем автомобіля на безпрецедентному рівні.
9. Необхідні терміни використання електронних компонентів у автомобільних додатках коливаються від 5000 годин для легкових автомобілів до 20 000 годин для комерційних транспортних засобів.
10. Електронні системи в сучасному автомобілі включають в себе круїз-контроль, антиблокувальну систему, регулювання тягової напруги, клімат-контроль, регулювання сидіння, електронні склопідйомники, керування блокуванням дверей.
11. Модулі, такі як регулятори напруги, витратоміри, перемикання потужності, допомагають електронним системам контролю регулювати механічні операції.

12. Спортивне і добре обладнане авто включає в себе панорамний дах, легкосплавні колеса, кондиціонер з клімат-контролем, шкіряне кермо, електросклопідйомники.

***Ex. 6. Prepare reports using Internet or other sources (catalogues, magazines, books, etc.) about the latest news, achievements in the field concerning the topic of the unit***



## UNIT 13

### DOES A HYBRID MAKE FINANCIAL SENSE?

#### *Ex. 1. Learn the vocabulary*

assume [ə'sju:m] – припускати, допускати

compelling reason – неспростовний довід, вагома причина

deforestation [di'fɔ:ris'teɪʃ(ə)n] – вирубка лісу

diminish – зменшити

environmental priorities – екологічні пріоритети

equation [i'kweɪʒ(ə)n] – рівняння

figure out – підраховувати

fossil fuel – природне паливо

garner ['gɔ:nə] – запасати

habitat destruction – знищення місця проживання

insulate ['ɪnsjʊlɪt] – ізолювати

insurance [ɪn'ʃʊ(ə)rəns] – страхування

interior [ɪn'ti(ə)rɪə] – простір усередині (чого-небудь), інтер'єр

low emissions – низькі викиди

payback period – період окупності

plug-in – підключений до мережі, штепсельне з'єднання, зі штепсель-  
НИМ КОНТАКТОМ

recharge ['ri:tʃɑ:dʒ] – перезаряджати

sustainable – стійкий

tight budget [taɪt 'bedʒɪt] – обмежений бюджет

variable ['ve(ə)rɪəb(ə)l] – мінливий, непостійний

viable ['vaɪəb(ə)l] – життєздатний, практично здійсненний

#### *Ex. 2. Read and translate the text*

There are increasingly large numbers of hybrid vehicles on the road these days. Does a hybrid make financial sense? This is the question on the mind of thousands of car buyers and there is no simple answer.

Calculate how long the green car payback period will be for any car at any gas price to help you decide if the return on your hybrid investment is worthwhile. Their combination of fuel efficiency and low emissions make them a popular choice, but are they the right choice for you? The answer depends on several factors including your financial situation, your daily driving habits, and your environmental priorities. The hybrid is the new “status” vehicle and you can expect this trend to grow. The payback periods range from less than four months to more than 17 years!

The first gasoline-electric hybrid was introduced in 1917. However, it was a commercial failure because it was too slow and too difficult to service. The hybrid did not again become a viable concept until the late 1990s when Toyota

Motor Company introduced the Prius in Japan in 1997. Honda became the second auto manufacturer to offer a hybrid in 1999.

Cost of Gas			
	Hyundai Sonata SE	Hyundai Sonata SE Hybrid	Hybrid Savings
Weekly	\$25	\$17	\$8
Monthly	\$108	\$73	\$35
Annual	\$1,293	\$872	\$421
10 Years	\$12,930	\$8,720	\$4,210
Per Mile	\$0.086	\$0.058	\$0.028

Gas prices aren't as high today, but they can change quickly. Driving a hybrid vehicle insulates you somewhat from a sudden increase in gas prices. This is an especially compelling reason to buy a hybrid if you're on a tight budget. There's also the price of the hybrid itself to consider. Insurance costs and registration fees often rise along with the cost of a car so be sure you check those numbers before you buy.

You might think the gas savings on a hybrid are enough financial reason to buy, but there are lots of variables in that equation. Don't assume you'll automatically save a ton of cash by going the hybrid route. Figure out how much you typically drive, how much extra you'll pay for the hybrid you want, and how much extra you'll pay to keep it on the road and then decide if it's financially right for you.

Purchase a plug-in hybrid and you also get parking that's often closer to the door in parking lots at malls, airports and office buildings. A plug-in lets you rely even less on your gas engine by recharging your battery with electricity from a charging station.

There's also the benefit to the environment. Drivers of eco-friendly cars consume a minimum of natural resources and use less fossil fuel. Plug-in hybrids are the best choice if this is your priority. Electric cars are made to cope with the issue of environment pollution. So, people have to start adopting such environment friendly vehicle.

Some of the newest hybrid cars are using sustainable and recyclable materials with which to construct the interior of these vehicles. This will slow down the use of materials garnered from deforestation as well as prevent habitat destruction. This directly helps keep nature cleaner and more healthy and diminishes the amount of pollutants released when driving these superb vehicles. Car owners choose eco-friendly cars for both environmental, political and money-saving reasons. Eco-friendly cars are relatively new to the market, but drivers are quickly picking up on the many benefits that eco-friendly cars offer.

**Ex. 3. Answer the following questions**

1. Is it worth buying hybrid vehicles?
2. What are the reasons for buying hybrid?
3. What is approximate hybrid's payback period?
4. When was the first hybrid introduced?
5. Why was the first gasoline-electric hybrid a commercial failure?

6. How can a sudden increase in gas prices influence your budget?
7. What aspects should you think over before buying a hybrid?
8. What are the benefits for the environment?
9. Does a hybrid car keep nature cleaner?
10. What was the first commercial hybrid car?
11. Why do people have to start adopting environment friendly vehicle nowadays?
12. What is your favourite car? Why? Speak about its speed, price, electronic system?

**Ex. 4. Match, rewrite, translate into Ukrainian**

1) efficiency	a) energy, fuel, economic, operational, production
2) environmental	b) carbon, control
3) insulate	c) science, pollution, policy, studies, protection
4) emission	d) cables, cylinder, floor
5) diminish	e) responsibility, capacity
6) compelling	f) complex, quadratic
7) equation	g) reason, interest, argument
8) sustainable	h) costs, value
9) initial	i) development
10) vehicle	j) materials, metals
11) recyclable	k) transport, registration
12) driver	l) taxi, bus, truck

**Ex. 5. Translate the following sentences into English**

1. Управління двигуном BMW здійснюється електронним шляхом.
2. Honda стала першою компанією, яка випустила сучасний гібрид у США.
3. У 1917 році був винайдений перший бензино-електричний гібрид, який мав декілька недоліків.
4. Якщо ви маєте обмежений бюджет, краще придбайте екологічний автомобіль.
5. Екологічні автомобілі є відносно новими для ринку на території України.
6. У Європі власники автомобілів часто вибирають екологічні автомобілі.
7. Honda стала другим автовиробником, який запропонував гібрид у 1999 році.
8. Ціни на газ сьогодні не високі, але вони можуть швидко змінюватися протягом місяців.
9. Страхові витрати та реєстраційні збори часто зростають разом із вартістю автомобіля.

10. Новий автомобіль Nissan GT-R п'ятого покоління прибуде у виставочні зали у червні.

11. Це допомагає зберегти природу чистою і зменшує кількість забруднюючих речовин, що виділяються під час керування цими транспортними засобами.

12. Деякі з найновіших гібридних автомобілів використовують стійкі та переробні матеріали, з яких можна виробити інтер'єр цих транспортних засобів.

***Ex. 6. Prepare reports using Internet or other sources (catalogues, magazines, books, etc.) about the latest news, achievements in the field concerning the topic of the unit***

## UNIT 14

### THE TOYOTA CAMRY HYBRID

#### *Ex. 1. Learn the vocabulary*

7-inch touch screen – 7-дюймовий сенсорний екран

ample ['æmp(ə)l] – просторий, місткий

available features – доступні, наявні функції

blind spot monitoring – моніторинг сліпого місця

counterpart – двійник

cubic feet – кубічні фути

dual-zone automatic climate control – двозонний автоматичний клімат-контроль

Entune System – це інтегрована система мультимедійної навігації та телематики, яка надає супутникові інформацію про трафік, погоду, запаси та ціни на паливо тощо; підключившись до сумісного стільникового телефону, що запускає додаток Entune за допомогою радіо або USB-кабелю, система забезпечує браузер та інші додатки; системою можна керувати за допомогою розпізнавання голосу

forward collision warning – попередження про зіткнення

front-wheel drive – передній привід

head-up display – головний дисплей

high-end materials – висококласні матеріали

infotainment system – інформаційно-розважальна система

insulated ['insjʊlɪt] – ізольований

lane departure warning – попередження про виїзд зі смуги

latch connector – засувний з'єднувач

mileage ['maɪlɪdʒ] – пробіг автомобіля в милях

moonroof – люк

nine-speaker JBL audio system – аудіосистема JBL з дев'ятьма гучномовцями

pedestrian detection – виявлення пішоходів

rear seat – заднє сидіння

redundant [ri'dendənt] – резервний, дублюючий

responsive – чутливий

rival – суперник

roof pillars – стовпи покрівлі

sedan [si'dæn] – седан

Siri Eyes Free – працює за допомогою кнопки голосової команди на кермі автомобіля, що дозволяє водію робити та приймати дзвінки, вибирати та відтворювати музику, слухати відправлення та отримання текстових

повідомлень, отримувати доступ до карт і отримувати маршрути, звукові сповіщення, налаштовувати нагадування тощо

slouch [slaʊtʃ] – незграбна, важка хода

smooth – спокійний, рівний

surround-view camera – камера об'ємного перегляду

trunk space – простір багажника

upgraded – оновлений

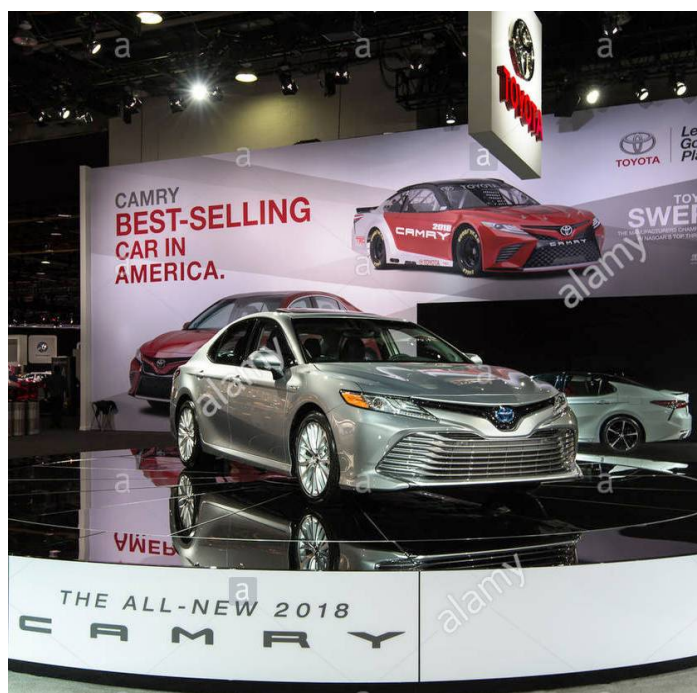
visibility – видимість

winding – звивистий, зигзагоподібний, витий

### ***Ex. 2. Read and translate the text***

The 2018 Toyota Camry Hybrid ranked № 3 in midsize cars. Currently the Toyota Camry Hybrid has a score of 9.0 out of 10 which is based on the evaluation of 23 pieces of research. The Toyota Camry Hybrid is definitely a good car. It gets outstanding fuel economy, even by hybrid standards, and it provides a smooth ride. Both rows of seats have ample space for adults, and because the battery is now under the rear seat, this Toyota has more trunk space than many other hybrid sedans.

Even the Camry Hybrid's weak spots aren't that bad. Sure, this isn't the most athletic car on the road, but it's no slouch, either, and far better than it ever has been. And while some rivals offer Apple Car Play and Android Auto (the Camry doesn't), the Camry Hybrid still has a long list of standard and available features, including lots of driver assistance technology.



The Camry Hybrid seats five people. The cabin is well-insulated from outside noise, and both rows of seats have enough space for adults. The rear seats have better legroom than many rivals, but the front seats might not have enough headroom for taller drivers. Visibility is great because of the thin roof pillars. There are two full sets of latch connectors for installing car seats. This Toyota has a stylish cabin that features high-end materials.

Many hybrids offer less space than their non-hybrid counterparts. Not the 2018 Camry. During the redesign, the battery was moved from the trunk area to

the rear seat, so the Camry Hybrid has the same 15.1 cubic feet as the non-hybrid Camry. That's enough space for a dozen carry-on bags.

Standard features in the Camry Hybrid include dual-zone automatic climate control, a USB port, and the infotainment system with a 7-inch touch screen, Siri Eyes Free and Bluetooth. Available features include a moon-roof, satellite radio, a nine-speaker JBL audio system, a Wi-Fi hot spot, navigation, and an upgraded Entune system with an 8-inch touch screen. Infotainment system is intuitive and easy to use. The touch screen is responsive, and there are redundant physical controls for some functions. There are plenty of tech features, but the Camry Hybrid doesn't offer Android Auto, which can be found in several other cars in the class.

The Camry Hybrid features an electric motor and a four-cylinder engine that combine to put out 208 horsepower, making this Toyota one of the more powerful hybrid sedans on the market. Power and acceleration are ample for most driving situations. The Toyota Camry Hybrid got even more fuel-efficient after its redesign. Better gas mileage means more money in your pocket. In fact, with the Camry Hybrid, you'll spend about as little on gas as you would with a Toyota Prius.

The Camry Hybrid still isn't on the level of some of the sportiest midsize cars, but it handles well on winding roads. It also delivers a smooth ride over most road surfaces. Front-wheel drive is standard. Standard active safety features include a rearview camera, adaptive cruise control, a forward collision warning, pedestrian detection, and lane departure warning. Available features include a head-up display, blind spot monitoring and a surround-view camera.

***Ex. 3. Answer the following questions***

1. What score out of 10 has the Toyota Camry Hybrid?
2. Is the Toyota Camry Hybrid a good car?
3. Which rows of seats have ample space for adults?
4. Where is the battery located in?
5. How can one call the Toyota Camry Hybrid – a slouch or a quick one?
6. How many people does the Toyota Camry Hybrid seat?
7. Why is visibility great in this car?
8. Is the Toyota Camry Hybrid Reliable?
9. How are car seats installed in the Toyota Camry Hybrid?
10. What is the difference between the Camry Hybrid and Android Auto?
11. What feature of this car means saving money for you?
12. What do active safety features of the car include?

***Ex. 4. Fill in the gaps with the given words***

*a) fuel source, b) combustion engine, c) run out of energy, d) the batteries, e) the cheaper choice, f) heavy highway vehicles, g) financially attractive, h) greater fuel economy, i) reduce air emissions, j) green vehicles, k) low power.*

1. Compared to regular cars of a similar size, the petrol part of a hybrid's engine is smaller, and the electric motor is usually \_\_\_\_\_.
2. Hybrid cars essentially combine an electric motor with a \_\_\_\_\_ (usually petrol).
3. When the speed climbs above a certain level or the battery begins \_\_\_\_\_, the car automatically switches to the conventional engine to power the wheels and charge the \_\_\_\_\_.
4. In comparison to hybrids, diesel cars are almost always \_\_\_\_\_ to buy too.
5. Hybrid systems are coming into use for trucks, buses and other \_\_\_\_\_.
6. For some users, this type of vehicle may also be \_\_\_\_\_ so long as the electrical energy being used is cheaper than the petrol / diesel.
7. The hybrid vehicle typically achieves \_\_\_\_\_ and lower emissions than conventional internal combustion engine vehicles.
8. Hybrid vehicles can \_\_\_\_\_ of smog-forming pollutants by up to 90% and cut carbon dioxide emissions in half.
9. Other types of \_\_\_\_\_ include other vehicles that go fully or partly on alternative energy sources than fossil fuel.
10. Generally speaking, a hybrid car is any car that uses more than one \_\_\_\_\_.

***Ex. 5. Translate the following sentences into English***

1. Багато гібридних авто пропонують менший простір, ніж негібридні.
2. Ця машина має стильний салон, який оснащений висококласними матеріалами.
3. Потужностей і прискорення достатньо для більшості ситуацій на дорозі.
4. Інші доступні функції авто містять головний дисплей та камеру об'ємного перегляду.
5. 7-дюймовий сенсорний екран в цій машині дуже дорогий, зроблений в Америці.
6. Десять автомобільних заводів в усьому світі займаються виробництвом цієї моделі.
7. The Toyota Camry Hybrid з'явилась в автосалонах 100 країн влітку 2017 року за ціною від 25 000 доларів.
8. Задні сидіння мають більше місця для ніг, але передні сидіння можуть не мати достатньої висоти для високих водіїв.
9. Салон автомобіля добре ізольований від зовнішнього шуму, і обидва ряди місць мають достатньо місця для дорослих.
10. Доступні функції авто містять супутникове радіо, аудіосистему JBL з дев'ятьма гучномовцями, точку Wi-Fi та навігацію.



11. Стандартні особливості Camry Hybrid містять клімат-контроль, USB-порт та інформаційно-розважальну систему із 7-дюймовим сенсорним екраном.

12. Автомобіль Camry Hybrid оснащений електродвигуном та чотирициліндровим двигуном, що робить Toyota одним з найпотужніших гібридних седанів на ринку.

***Ex. 6. Prepare reports using Internet or other sources (catalogues, magazines, books, etc.) about the latest news, achievements in the field concerning the topic of the unit***

## UNIT 15

### TRAFFIC REGULATIONS FOR DRIVING ON THE AUTOBAHN

#### *Ex. 1. Learn the vocabulary*

- adhere to [əd'hɪə] – дотримуватися  
adjacent [ə'dʒeɪs(ə)nt] – прилеглий, суміжний  
anarchy ['ænəki] – анархія, відсутність правопорядку, хаос  
autobahn (pl- en) ['ɔ:tə(u)bɔ:n] – автострада  
Cologne [kə'ləʊn] – місто Кельн (Німеччина)  
deem – вважати  
emergency vehicle – спецмашина (поліцейська, пожежна)  
emphasis (pl- ses) ['emfəsis] – наголос, акцент  
expressway [ɪk'spresweɪ] – швидкісна автомагістраль з розв'язками на різних рівнях  
facilitate [fə'sɪlɪteɪt] – полегшувати, сприяти  
Frankfurt [frʌŋkfʊt] – місто Франкфурт (Німеччина)  
freeway – швидкісна автострада з транспортними розв'язками  
hazard blinkers – вогні попередження про небезпеку назовні транспортного засобу, які швидко включаються та вимикаються  
heavy traffic – інтенсивний рух  
highways – магістраль, шосе  
lane – ряд руху транспорту, смуга руху (для дотримання рядності)  
motorists – автомобіліст, водій автомобіля  
Munich [mjuːnɪk] – місто Мюнхен (Німеччина)  
occurrence [ə'kerəns] – випадок, подія  
passing on the right – обгін справа  
pedestrian – пішохід  
pinnacle ['pɪnəkl(ə)l] – вершина, кульмінаційний пункт  
prohibit – забороняти  
queue [kjuː] – стояти в черзі  
refuge ['refjuːdʒ] – острівцець безпеки (на вулиці або дорозі з інтенсивним рухом транспорту)  
run out of fuel – вичерпати паливо  
shoulder – виступ, узбіччя дороги  
slowdown – уповільнення  
smoke ventilation system – система вентиляції диму  
toll – мито, збір  
unimpeded [ʌnɪm'pɪdɪd] – безперешкодний  
urban area ['z:bən] – міська територія  
valley bridge ['vælɪ] – міст через долину  
virtually ['vɜ:ʃʊəlɪ] – фактично, власне кажучи  
warning triangle – попереджувач про небезпеку трикутник  
yield – поступатися

### ***Ex. 2. Read and translate the text***

The German freeway system, the Autobahn, links most of the country's major cities. The Autobahn is the pinnacle of the German driving experience. Virtually all of the world's serious drivers have heard of it. Some of the fastest and busiest highways in Europe connect Frankfurt to Munich. The Autobahn looks like a typical freeway. The stories of speed anarchy are only half correct – many sections of Autobahn have speed limits.

The world's first motorway was built in Berlin between 1913 and 1921. Italy built several expressways in the 1920s and Germany followed with its first "auto-only roads" opening in 1929 between Düsseldorf and Opladen and in 1932 between Cologne and Bonn. The general rule for design is to provide for unimpeded, high-speed traffic flow.

To help maintain safe grades, the Autobahn system has extensive tunnels and bridges. So-called "valley bridges" are often over 500 meters high and sometimes over 1 kilometer long. The Autobahn system now has over 70 tunnels, both through mountains as well as in urban areas. As a result of the tunnel disasters elsewhere in Europe during the past decade, extra emphasis has been placed on tunnel safety. All Autobahn tunnels have extensive safety systems including 24-hour monitoring, motorist information radio and signs, frequent refuge rooms with emergency telephones and firefighting equipment, emergency lighting and exits, and smoke ventilation systems.

To safely facilitate heavy, high-speed traffic, special laws apply when driving on the Autobahn.

Bicycles, mopeds and pedestrians are specifically prohibited from using the Autobahn, the same as any other vehicles with a maximum speed rating of less than 60 km/h.

Passing on the right is also strictly prohibited. Slower vehicles must move to the right to allow faster traffic to pass, and drivers should stay in the right lane except to pass. You are, however, allowed to pass on the right in heavy traffic when vehicles have started queuing, but only at a low speed.

Traffic entering the Autobahn must yield to traffic already on the Autobahn.

On Autobahn sections with three travel lanes, trucks over 3.5 tonnes and any vehicle with a trailer are prohibited from using the far left lane.

During traffic jams, motorists in the left lane are required to move as far to the left as possible. And those in the adjacent center or right lane must move as far to the right in their lane as possible, thus creating a gap between the lanes for emergency vehicles to pass through.

If you have a breakdown or accident, you must move to the shoulder if possible and place a warning triangle 200 meters behind the scene. You must report the incident to the authorities using the nearest emergency phone.

It is illegal to run out of fuel on the Autobahn. Technically, there is no law specifically against this, but it is illegal to stop unnecessarily on the Autobahn and this law is also applied to people who run out of fuel as such an occurrence is deemed to be preventable.

There are no tolls for passenger vehicles to use the Autobahn. However, trucks must pay a per-kilometer fee which is collected electronically.

In addition to the official laws, most drivers adhere to the following customs: motorists at the rear of a traffic jam usually switch on their hazard blinkers to warn approaching traffic of the slowdown.

***Ex. 3. Answer the following questions***

1. What is the Autobahn in Germany?
2. When was the Autobahn constructed?
3. Is there anything like the Autobahn in Ukraine?
4. Why do special laws apply when driving on the Autobahn?
5. Should there be an autobahn in Ukraine?
6. Are bicycles, mopeds and pedestrians prohibited from using the Autobahn?
7. Would the Autobahn system work in Ukraine?
8. Must slower vehicles move to the right to allow faster traffic to pass?
9. Are you allowed to pass on the right in heavy traffic when vehicles have started queuing?
10. What do you do if you have a breakdown or accident on the Autobahn?

***Ex. 4. Decide if the following sentences are true (T) or false (F)***

1. The German freeway system, the Autobahn, doesn't link most of the country's major cities.
2. Some of the fastest and busiest highways in Europe connect Berlin to Munich.
3. The Autobahn doesn't look like a typical freeway.
4. The stories of speed anarchy are correct.
5. The world's first motorway was built in Berlin between 1913 and 1921.
6. Italy never built several expressways.
7. The Autobahn system has narrow tunnels and bridges.
8. The Autobahn system now has over 70 tunnels, both through mountains as well as in urban areas.
9. Bicycles, mopeds and pedestrians are allowed to use the Autobahn, the same as any other vehicles with a maximum speed rating of less than 60 km/h.
10. Trucks mustn't pay a per-kilometer fee which is collected electronically.

***Ex. 5. Translate the following sentences into English***

1. Обмеження швидкості регулюється відповідно до погодних умов.
2. Будівництво автобану – дуже складний і відповідальний процес.
3. Однією з особливостей автобанів є пробки поблизу великих міст.
4. Додаткові будівельні роботи були зроблені щодо безпеки тунелю.
5. Більшість водіїв дотримуються правил дорожнього руху.
6. Дорожній затор («пробка») може статися через аварію або ремонтні роботи.

7. Деякі з найшвидших магістралей у Європі з'єднують Франкфурт з Мюнхеном.

8. Зупинятися на автобані незаконно і це також стосується людей, у яких закінчилось паливо.

9. У Німеччині користування автобанами для легкового транспорту безкоштовне.

10. Протипожежне обладнання, аварійне освітлення та виходи, системи вентиляції диму є частиною системи безпеки автобану.

11. Загальне правило проектування автобану – забезпечити безперешкодний, високошвидкісний трафік.

12. На німецьких автобанах є безліч обладнаних автостоянок: з лісопарками, автозаправними станціями, готелями та кафе.

***Ex. 6. Prepare reports using Internet or other sources (catalogues, magazines, books, etc.) about the latest news, achievements in the field concerning the topic of the unit***

## UNIT 16

### SPEED REGULATIONS FOR DRIVING ON THE AUTOBAHN

#### *Ex. 1. Learn the vocabulary*

adjust [ə'dʒʌst] – пристосовувати, встановлювати

adverse ['ædvɜ:s] – несприятливий

advisory [əd'vaɪz(ə)rɪ] – рекомендаційний

at fault – винний

Bremen [breɪmən, brāmən, bremən] – місто Бремен (Німеччина)

congestion [kən'dʒesʃ(ə)n] – затор (вуличного руху), скупченість, перевантаженість

curve [kɜ:v] – поворот дороги

detect – виявляти

elaborate [ɪləb(ə)rət] – ретельно, детально розроблений, продуманий

enact [ɪ'nækt] – постановляти, вводити в дію (закон)

imposed – встановлен

on-board telematics systems – бортові телематичні системи

outfit – споряджати

Porsche [pɔ:ʃ]

restrictions – обмеження

roadside signs – дорожні знаки

robust economy [rə'best, 'rəʊbest] – стабільна, надійна економіка

sophisticated traffic management system – складна система управління трафіком

speed sensors – датчики швидкості

surveillance [sɜ'veɪl(ə)ns] camera – камера спостереження

#### *Ex. 2. Read and translate the text*

Despite the widespread belief of complete freedom from speed limits, some speed regulations can be found on the Autobahns. Many sections do indeed have permanent or dynamic speed limits ranging from 80 to 130 km/h, particularly those with dangerous curves, in urban areas, or with unusually constant heavy traffic.

Also, some sections now feature nighttime and wet-weather speed restrictions, and trucks are always regulated. About two-thirds of the Autobahn network has no permanent speed limit, although there is always an advisory limit of 130 km/h. This recommendation is generally seen for what it is an attempt by the government to cover itself without having to upset millions of Porsche and BMW owners. However, if you exceed the advisory limit and are involved in an accident, you could be held responsible for some of the damages even if you are not at fault.

Over 3,200 km of Autobahn now feature dynamic speed limits which are ad-

justed to respond to traffic, weather and road conditions. These speed limits and conditions are indicated using a rather elaborate system of electronic signs. The Greens claim that the high speeds contribute to air pollution which has caused forest destruction. As a result, some Autobahns in forest areas have seen new limits imposed. In 2008, the federal city-state of Bremen enacted a 120 km/h speed limit on all Autobahns in that state, the first and thus far only federal state to do so. Because of Germany's robust economy and location in central Europe, traffic on the Autobahn is generally quite heavy. Traffic jams occur frequently on the Autobahn, especially on Fridays, Sundays, holidays, and anytime after an accident or during bad weather or road work.

Many sections of Autobahn are equipped with traffic monitoring systems and dynamic signs to warn congestion, provide a controlled reduction in the speed of traffic as it approaches the jam, and suggest alternate routes. On sections without digital signs, the Autobahn police generally do an excellent job of warning of congestion via portable roadside signs. Traffic information is also available from several other resources including the websites of radio and TV stations, auto clubs, government agencies, online maps, and increasingly through on-board telematics systems.

German traffic engineers have developed extensive and sophisticated traffic management systems to manage the increasingly congested traffic along many Autobahns and expressways. These systems consist of surveillance cameras, speed sensors, and a variety of variable message signs. Also they have equipment to detect and automatically warn of adverse weather including fog, rain and ice, all connected by communications systems to centralized traffic monitoring and control centers located throughout the country. Studies have shown that these systems have reduced accidents by as much as 30 % within three years of being installed. The first such systems were developed and tested in the mid 70s and since have been expanded to over 2,500 km of Autobahn, in areas which are subject to frequent congestion or dangerous weather conditions.

In the event of an accident, breakdown, or other emergency along the Autobahn, you are never more than a kilometer away from help. Nearly 17,000 emergency telephones are located at 2 km intervals along the sides of the road. The Autobahn expressway system covers the majority of Germany, and therefore has been equipped with rest stops every 40-60 km. These service areas are usually outfitted with a fuel station, restaurant, small convenience store, bathrooms and telephones, though some even have hotels available. Because driving on the Autobahn can be a tiring task, it is advisable to stop and rest for a short time every 100 km or so.

***Ex. 3. Answer the following questions***

1. How fast do most people drive on the Autobahn?
2. How is the Autobahn safe if there's no speed limit?
3. Would you rent a fast car in Germany and drive it at top speed on the Autobahn?

4. Why doesn't Ukraine have freeways with no general speed limit, like the German Autobahn?
5. What speed limits do many sections have?
6. Is there always an advisory limit of 130 km/h?
7. Will you be responsible for some of the damages if you exceed the advisory limit and accident happens, even if you are not at fault?
8. Are speed limits adjusted to respond to traffic, weather and road conditions?
9. Does the high speed contribute to air pollution?

***Ex. 4. Correct mistakes in the following sentences***

1. German traffic engineers has developed extensive and sophisticated traffic management systems.
2. These systems consist on surveillance cameras.
3. Studies have shown that this systems have reduced accidents by as much as 30% within three years of being installed.
4. The first such systems was developed and tested in the mid 70s and since have been expanded to over 2,500 km of Autobahn.
5. Many sections of Autobahn is equipped with traffic monitoring systems and dynamic signs to warn congestion, provide a controlled reduction in the speed of traffic as it approaches the jam, and suggest alternate routes.
6. On sections without digital signs, the Autobahn police generally do a excellent job.
7. Traffic information are also available from several other resources.
8. Speed limits and conditions are indicate using a rather elaborate system of electronic signs.
9. The Greens claim that the high speeds contribute with air pollution which has caused forest destruction.
10. Because of Germany's robust economy and location in central Europe, traffic on the Autobahn are generally quite heavy.

***Ex. 5. Translate the following sentences into English***

1. Рух вантажних авто завжди регулюються.
2. Більшість мережі автобану не має постійного ліміту швидкості.
3. Якщо ти їдеш по автобану, рекомендовано відпочивати кожні 100 км.
4. Деякі автобани в лісових районах зазнали нових обмежень швидкості.
5. На автобані передбачено обмеження швидкості руху вночі та в умовах поганой погоди.
6. Німецькі інженери дорожнього руху розробили великі та складні системи управління трафіком.
7. Ці системи складаються з камер відеоспостереження, датчиків швидкості та різних сигнальних знаків.
8. Для контролю швидкості на автобані використовується досить складна система електронних знаків.



9. Зелені стверджують, що висока швидкість сприяє забрудненню повітря, і, як результат, руйнування лісу.

10. Інформація про дорожній рух доступна з онлайн карт, бортових телематичних систем, радіостанцій.


























11. Багато секцій автобану дійсно мають постійні обмеження швидкості до 80 км/год, особливо у містах.


























12. На ділянках без цифрових знаків, поліція попереджає про затори завдяки портативним дорожнім знакам.

***Ex. 6. Prepare reports using Internet or other sources (catalogues, magazines, books, etc.) about the latest news, achievements in the field concerning the topic of the unit***

## APPENDIX ROAD TRAFFIC SIGNS

### *Warning Signs*

				
General danger	Curve left	Curve right	Double curve	Double curve
				
Accident hazard	Sliding danger	Winter sports along road	Soft shoulder	Rough road edge
				
Tree overhang	Soft shoulder for heavy vehicles	Steep upgrade	Steep downgrade	Falling rocks
				
Strong cross wind	Rough road	Beware of ice/snow	Slippery road	Loose gravel
				
Road works	Traffic signals	Quay/riverbank	Drawbridge	Pedestrians

				
Pedestrian crossing	Children	Wild animals crossing	Domestic animal crossing	Frog crossing
				
Congestion hazard	Bicycle crossing	Buses	Low-flying aircraft	Two-way traffic
				
Road narrows	Road narrows	Road narrows	Railway crossing ahead	Guarded railway crossing ahead
				
Railway crossing on crossroad	Railway crossing on crossroad	Railway crossing on crossroad	Railway crossing on crossroad	Unmarked intersection ahead
				
Priority	Railway crossing 240 meters ahead	Railway crossing 160 meters ahead	Railway crossing 80 meters ahead	Railway crossing










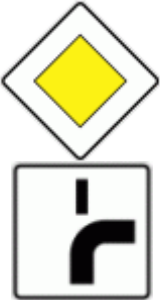










## Regulatory Signs

 <p>No passing</p>	 <p>No passing for vehicles over 3.5t</p>	 <p>Road closed</p>	 <p>Motor vehicles prohibited</p>	 <p>Vehicles over 3.5t prohibited</p>
 <p>Bicycles prohibited</p>	 <p>Mopeds prohibited</p>	 <p>Motorcycles and mopeds prohibited</p>	 <p>Multiple prohibition</p>	 <p>Horses prohibited</p>
 <p>Pedestrians prohibited</p>	 <p>Vertical clearance</p>	 <p>Horizontal clearance</p>	 <p>Length restriction</p>	 <p>Vehicles over 7.5t prohibited</p>
 <p>Weight limit</p>	 <p>Axle weight limit</p>	 <p>Minimum following distance</p>	 <p>Hazardous cargo prohibited</p>	 <p>Water polluting cargo prohibited</p>
 <p>No passing</p>	 <p>No passing</p>	 <p>No passing</p>	 <p>Emergency traffic restriction due to air pollution</p>	 <p>Traffic restriction zone for reduction of air pollution</p>

				
<b>End of no passing zone</b>	<b>End of no passing zone for vehicles over 3.5t</b>	<b>End of all restrictions</b>	<b>End of traffic restriction</b>	<b>Snow chains or tires required</b>
				
<b>Lane shift with width restriction</b>	<b>Lane shift with width restriction</b>	<b>Lane shift with width restriction</b>	<b>Lane shift with width restriction</b>	<b>Lane shift with width restriction</b>
				
<b>Do not enter</b>	<b>No U-turn</b>	<b>Turn left ahead</b>	<b>Turn right ahead</b>	<b>Turn either left or right</b>
				
<b>Straight ahead</b>	<b>Mandatory direction of travel</b>	<b>Mandatory direction of travel</b>	<b>Turn left</b>	<b>Turn right</b>
				
<b>Keep left</b>	<b>Keep right</b>	<b>Pedestrians only</b>	<b>Bus lane</b>	<b>Horses only</b>
				
<b>Pedestrian zone</b>	<b>End of pedestrian zone</b>	<b>Bus lane</b>	<b>End of bicycle path</b>	<b>Emergency way-side</b>

				
Tunnel	Autobahn en-	Expressway en-	End of Autobahn	End of expressway
				
Pedestrian and bicycle path	Split pedestrian and bicycle path	One way street	Traffic calming zone	End of traffic calming zone
				
Bicycles only	Bicycle path; Mopeds also allowed	One way street Bicycles may travel in either directions	Shoulder lane ends	End of shoulder lane
				
Shoulder open to traffic	Advisory speed limit	Minimum speed limit	End of minimum speed limit	End of advisory speed limit
				
One way street	Speed limit zone	Maximum speed limit (km/h)	End of speed limit	End of speed limit zone
				
Conditional speed limit	Minimum speed limit by lane	Minimum speed limit by lane	End of minimum speed limit by lane	End of minimum speed limit by lane








## Right-Of-Way Signs

				
Priority road	End of priority road	Yield	Stop	Yield to oncoming traffic
				
Priority road turns left	Priority road turns left	Priority road turns left	Priority road turns right	Priority road turns right
				
Yield to Priority road	Yield to Priority road	Stop ahead	Yield and watch for bicycles	Yield to roundabout
				
Stop and yield to Priority road	Stop and yield to Priority road	Stop and yield to Priority road	Stop and yield to Priority road	Priority over oncoming traffic




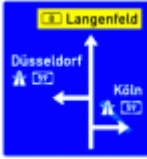













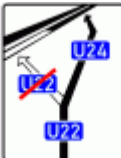
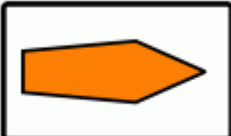

## Parking Signs

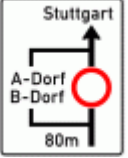
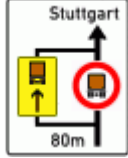










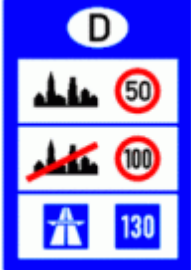

















				
No stopping	No parking	End of a no stopping area	Stopping is prohibited in either direction	Beginning of a no stopping area
				
End of a no parking area	Parking is prohibited in either direction	Beginning of a no parking area	Parking restriction zone	End of parking restriction zone
				
No stopping on shoulder	No parking on shoulder	Taxi stand	Directions to parking	
				
Parking	Parking garage	Indexed parking facility	End of a parking area	start of a parking area
				
Parking management zone	End of parking management zone	Park and ride	Hiker's parking	Parking on sidewalk permitted



				
Parking on sidewalk permitted	Parking on sidewalk permitted	Parking on sidewalk	Restricted parking	Restricted parking
				
Special parking	Special parking			

*Information and Guide Signs*

				
Advance direction sign	Advance direction sign	Consolidated direction sign	Autobahn entrance direction sign	Routing for designated vehicles
				
Routing for designated vehicles	Autobahn interchange initial approach sign	Autobahn interchange advance directional sign	Autobahn interchange number	Autobahn interchange countdown markers
				
Autobahn exit	Expressway exit	Expressway exit	Truck stop	Autobahn distance board
				
Numbered detour route	Provisional detour	Provisional detour	Alternate route	End of alternate

				
Detour route schematic	Routing schematic for designated	Complicated traffic route	Complicated traffic route	Bus or streetcar stop
				
Dead end street	Water protection area	Dead end street	Turn headlights on	Turn headlights off
				
Dead end street	School bus stop	National speed limit	Construction project information	Exit
				
Customs post	Toll road	Toll road	Streetlight does not stay on all night	Parking hazard
				
Mobile lane closure board	Pedestrian underpass	Pedestrian bridge	Detour direction	End of detour
				
Entering urban	Leaving urban	Pedestrian crossing	Crossing guards	Lanes added to another roadway

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## **АНГЛІЙСЬКА МОВА ДЛЯ СТУДЕНТІВ-АВТОМОБІЛІСТІВ**

Навчальний посібник

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