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Луцького національного технічного університету»



Іноземна мова
(за професійним спрямуванням)

Методичні вказівки до виконання самостійної роботи для здобувачів
освітньо-професійного ступеня фаховий молодший бакалавр спеціальності
274 Автомобільний транспорт денної форми навчання



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Методичні вказівки складаються із 28 самостійних робіт (текстів, діалогів, вправ), які містять окрему фахову проблему – тему, і включають оригінальні тексти із зарубіжної технічної літератури. До текстів пропонуються післятекстові вправи та завдання на відпрацювання мовленнєвих навичок і вмінь використання лексичного матеріалу, що вивчається. Побудова системи завдань до кожного тексту визначається методичним призначенням цих текстів. При розробці системи завдань і вправ використовувались елементи функціонально-комунікативного навчання в іноземній мові, при якій явище мови (лексика і граматики) розглядаються не тільки як система правил і особливостей, але й і як система комунікативних функцій.

Призначені для здобувачів освітньо-професійного ступеня фаховий молодший бакалавр денної форми навчання.

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Передмова

Методичні вказівки призначені для виконання самостійної роботи для здобувачів освітньо-професійного ступеня фаховий молодший бакалавр спеціальності 274 Автомобільний транспорт денної форми навчання.

Методичні вказівки складено згідно з вимогами навчальної програми з іноземної мови для підготовки фахових молодших бакалаврів з спеціальності 274 Автомобільний транспорт. Він охоплює базовий лексичний мінімум та нормативну граматику англійської мови.

Ціль вивчення англійської мови у коледжі полягає у практичному оволодінні мовою, навиками читання і перекладу літератури помірної складності зі спеціальності й елементарними навиками усної мови із актуальних фахових тем, передбачених програмою. Цим і визначається структура посібника, відбір і система подачі текстів, лексичного і граматичного матеріалу, а також характер вправ.

Методичні вказівки слугують введенням у спеціальність, оскільки відображають тісні міжпредметні зв'язки з теорією та конструкцією автомобілів, автомобільними двигунами, електрообладнанням автомобілів, технічною експлуатацією автомобілів, технологією конструкційних матеріалів, що сприяє формуванню професійної компетенції у процесі вивчення англійської мови (за професійним спрямуванням).

Методичні вказівки складаються із 28 самостійних робіт (текстів, діалогів, вправ), які містять окрему фахову проблему – тему, і включають оригінальні тексти із зарубіжної технічної літератури. До текстів пропонуються післятекстові вправи та завдання на відпрацювання мовленнєвих навичок і вмінь використання лексичного матеріалу, що вивчається. Побудова системи завдань до кожного тексту визначається методичним призначенням цих текстів. При розробці системи завдань і вправ використовувались елементи функціонально-комунікативного навчання в іноземній мові, при якій явище мови (лексика і граматики) розглядаються не тільки як система правил і особливостей, але й і як система комунікативних функцій.

Щоб уникнути переобтяженості кожного розділу, граматичний матеріал подається в кінці методичних вказівок у вигляді вправ, в яких знайшли своє відображення основні граматичні явища англійської граматики. Вправи допоможуть систематизувати знання і оволодіти основами граматики на основі нескладної професійної лексики. Вправи розміщено у порядку ускладнення – від простого до складного – і бажано дотримуватись послідовного їх виконання.

В кінці методичних вказівок подається словник професійних термінів та абrevіатур.

Методичні вказівки можуть бути використані здобувачами освіти автомобільного профілю, а також для широкого кола осіб, які вивчають професійну англійську мову.

Самостійна робота № 1

Theme Cars in our life.

Task to learn active vocabulary, to do lexical exercises.

1. What comes in your mind when you hear the word “CAR”?



2. Do you know that:

- the word “**car**” is believed to originate from the Latin word *carrus* or *carrum*, meaning “wheeled vehicle”, or the Middle English word *carre*, meaning “two-wheel cart”;
- the word “**automobile**” comes from two words *autos* (Greek) meaning “self”, and *mobilis* (Latin) meaning “movable”.

3. Discuss the questions below in pairs.

- Do you (or your family) have a car? What model is it?
- How old do you have to be to drive in Ukraine?
- Can you drive a car? Do you have a driving licence?
- If yes, are you a good driver? When did you get your licence?
- If no, do you want to get a driving licence? Why? Why not?
- Do you prefer to drive or to be passenger?
- Do people drive well in Ukraine?
- Would you like to drive a Formula One car?
- Are men or women better drivers? Why do you think so?

4. Put the verbs in brackets into Present Simple.

A car ____ (be) a machine that ____ (make) transportation much easier for us. It ____ (use) its own motor engine that ____ (help) it to do its job. Today there ____ (be) the most recycled product in the world. Almost 95% of the cars that ____ (be) not in working condition ____ (be) recycled. An average car ____ (have) around 30 000 different parts in it. A car engine ____ (look) like a complex jumble of metal, wires and tubes but it actually ____ (keep) the machine working.

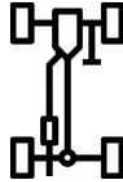
Самостійна робота № 2

Theme Cars in our life.

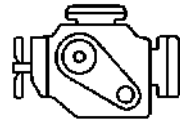
Task to do lexical exercises, to learn active vocabulary.

1. Can you identify the car parts? Match the pictures to the words:

*an engine, a wheel, a steering system, brakes,
a body, chassis, pedals, a steering wheel*



3



2. Make up the word combinations from columns A and B and find their equivalents in C.

A	B	C
1) volatile	a) fiberglass	двигун внутрішнього згоряння
2) strong	b) jam	кріпитися до рами
3) to propel	c) vehicle	транспортний затор
4) an internal combustion	d) do the shassis	завантажена дорога
5) a traffic	e) engine	дорожньо-транспортна пригода
6) an outer	f) a vehicle	автомобіль
7) a motor	g) accident	паливо, яке легко випаровується
8) a traffic	h) shell	приводити в рух транспортний засіб
9) a congested	i) fuel	міцне скловолокно
10) to attach	11) road	зовнішній корпус

3. Put the verbs in brackets into Present simple Passive. Translate the sentences.

In Paris today, the streets (crowd) with automobiles. 2. Two ropes (attach) to the bumper of a car. 3. Air (supply) to the brake system from the main reservoir. 4. Some areas (congest) with both cars and people. 5. This colourless gas (emit) mainly from cars and trucks. 6. Over 12 million cars (recycle) in the U. S. every year. 7. If someone (injure) in a car accident, you should not move him or her. 8. The doors of all Ferraris (make) from aluminium. 9. The ship (propel) by steam and (light) by electricity.

4. Read the text. Complete the sentences in par. 3-5 with the words (1-8) from ex 1.

1. It is hard to imagine what life was like before there were automobiles or cars. Cars and other motor vehicles have made it easy for people to travel within a city or across a continent. They have also affected how people live. People once had to live near their jobs, but now they can live farther away and drive to work.

2. Yet automobiles have brought problems as well. Tens of thousands of people are killed or injured each year in traffic accidents. Cities are often congested with huge traffic jams. And gasoline is a limited resource that pollutes the atmosphere.

3. An automobile is a four-wheeled vehicle designed mainly for passengers transportation and usually propelled by an internal-combustion _____ using a volatile fuel.

4. All automobiles have certain basic parts. The _____ of an automobile is the outer shell that encloses the vehicle's mechanical parts and its passengers. Most auto bodies are made of steel, but some are made of strong plastics or fiberglass. The body is attached to the _____. This consists of a frame that holds all the other major parts of the automobile together. Those other parts include an engine, a steering system, _____, and four _____. The _____ controls the direction in which a car moves.

5. A driver operates a car by pressing on _____ to make it go and stop and by turning the _____ to guide where the car goes. The pedals and steering wheel work because they are part of a larger system.

5. Find a word or expression in the text which is similar in meaning to :

a) A device for carrying people or objects (par. 1); b) a colourless liquid used as a motor fuel (par. 2); c) a long line of vehicles that cannot move forward because there is too much traffic (par. 2); d) to do physical harm or damage to someone (par. 2); e) to overfill or overcrowd (par. 2); f) an engine which generates power by the burning of fuel with air inside the engine (par. 3); g) to direct the motion of a vehicle (par. 5).

6. Complete the statements with the appropriate information from the text.

1. It is impossible to imagine our life
2. An automobile is a

3. The common auto body material is
4. The automobile basic parts are
5. A driver presses on pedals to
6. A driver turns the steering wheel to
7. The advantages of automobiles in our life are
8. The disadvantages of automobiles in our life are

Самостійна робота № 3

Theme Cars in our life. Advantages and disadvantages of automobile use.

Task to do lexical exercises, to learn active vocabulary.

1. Match the words having similar meaning.

1) an advantage	a) a congestion
2) a driver	b) to devote
3) a traffic jam	c) current
4) typical	d) a benefit
5) present-day	e) to emit
6) to produce	f) a motorist
7) city	g) to encourage
8) to motivate	h) urban
9) to give	i) average

2. The United States is a prime example of a car-centered nation. Complete the text below with the appropriate words and find out how transportation affects the life of people in the USA.

Air pollution, congestion, motor vehicles, motorists, environment, accidents, injure, maintenance, parking lots, climate-changing

_____ offer a convenient way to get people around. They are also symbols of power, social status and success for many people. And much of the world's economy is built on producing motor vehicles and supplying fuel, vehicle _____, and repairs.

Despite their important benefits, motor vehicles have harmful effects on people and the _____.every year, automobile _____ in the United States kill about 44 000 people and _____ another 2 million.

Motor vehicles are the world's largest source of outdoor _____, which kills about 100 000 people per year in the United States. They are also the fastest-growing source of _____ carbon dioxide emissions. The average car in the USA emits about 2.2 tons of CO₂ each year. In addition, half of the urban land is devoted to roads, _____, and gasoline stations.

Widespread use of motor vehicles cause traffic _____. If current trends continue, US will soon spend an average of 2 years of their lives in traffic jams. Building more roads may not be the answer because more roads usually encourage more people to drive.

3. Look through the text again. Discuss in groups.

- Are the transport problems in the USA similar to those in your country?
- In your opinion what is the best solution to reduce the harmful effects of automobile use?

- If you own a car or hope to own one, what conditions would encourage you to drive your car less and to travel to work by bicycle, on foot etc?

Below are some phrases that you can use to help express opinions.

I think...

I believe...

I suppose...

I guess...

In my view...

In my opinion...

It seems to me that...

From my point of view...

As far as I'm concerned...

Personally, I think...

I'd like to point out that...

Some people say that...

It is generally accepted that...

It goes without saying that...

4. Work in pairs. Make a list of advantages and disadvantages of automobile use. Add your own ideas of benefits and drawbacks. Share your opinions with your example.

S1 First of all, you can move quickly from one place to another and don't have to waste your time and wait for a bus.

S2 But a lot of cars cause traffic jams and you have to spend much time in these jams. So, it may not be so fast as you want.

Pros	Cons
1. Easy transportation of goods	1. Traffic jams
2. Flexibility	2. Air pollution
3. Reliability	3. A lack of parking spaces
4. ...	4. High parking charges

Самостійна робота № 4

Theme Car Logos and Manufacturers.

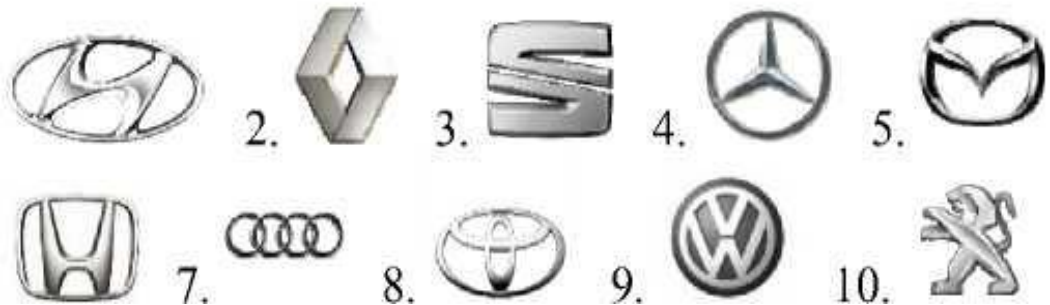
Task to do lexical exercises, to learn active vocabulary.

1. Discuss the questions below in pairs.

- What are the biggest car manufacturers in the world? Make a top 5.
- Are there any car manufacturing companies in your country?
- What are the best-selling cars in the world and in your country?
- What is your favourite car? Explain why.

2. Match the logos to the car manufacturers. Where are the car manufacturers from?

- a) Peugeot ['pɜːʒəʊ]
- b) Hyundai ['haɪ ən daɪ]
- c) Renault ['rɛnoʊ]
- d) Seat ['siːt]
- e) Mazda ['mæz də]
- f) Toyota [tɔɪ 'əʊt ə]
- g) Volkswagen ['fɒlks' va:gɪ]
- h) Honda ['hɒnd ə]
- i) Mercedes [mɜː 'seɪd ɪz]
- j) Audi ['aʊdi]



3. Do you know which of these cars:

- was named after a girl?
- has models named after Spanish cities or regions (Toledo, Malaga)?
- has models named after oceanic currents and winds (Golf)?
- has a logo symbolizing air, land and sea?
- has a name meaning “People’s car”?
- has a slanted, stylized ‘H’ in its logo which is symbolic of two people (i. e. the company and customer) shaking hands?

- has a logo with an image of wings in flight which symbolizes the car manufacturing company's flight toward the future?

4. Make up the word combination from columns A and B and find their equivalents in C.

A	B	C
1) quartered	a) works	транспортний засіб з високими експлуатаційними характеристиками
2) sophisticated	b) brand	автомобільний завод
3) motor	c) interior	витончений, вишуканий зовнішній вигляд
4) high-performance	d) feature	простір зсередини, розділений на чотири частини
5) aircraft	e) propeller	відмінна риса
6) distinctive	f) engine	авіаційний двигун
7) well-established	g) vehicle	гвинт, який обертається (пропелер)
8) spinning	h) appearance	широко відома торгова марка

Самостійна робота № 5

Theme Car Logos and Manufacturers. BMW.

Task to read the text, to do lexical exercises, to learn active vocabulary.

1. Read the text about one of the best-selling automakers in the world. Discuss which fact is the most interesting for you.

BMW is a well-established brand in the car industry and is possibly the best-known German manufacturer. It has become synonymous with high-performance vehicles that are sophisticated in appearance and comfortable to drive. While most people are aware of this company due to its long history and the high numbers of cars it has produced, not everyone knows specific details about this company and the vehicles they have manufactured over the years. Here are some interesting facts you might not know about the car manufacturer BMW:

1. BMW, which stands for Bayerische Motoren Werke (Bavarian Motor Works), started out by making aircraft engines in 1916. It was during World War I when there was the need for air-plane engines.

2. Following the war, the terms of the Treaty of Versailles banned German companies from producing warplanes and their engines. For this reason, BMW was forced to begin manufacturing cars to remain in business.

3. The headquarters of BMW in Munich, Bavaria, have a rather unusual design. They represent the shape and design of BMW's famous four-cylinder engines. BMW is famous for its four-cylinder heritage and designers of the headquarters wanted to reflect this.



4. During a particularly difficult period in BMW's history in the 1950s, they were almost taken over by Mercedes. BMW had almost gone bankrupt by 1959 and one reason for this was the Cold War. However, BMW managed to find a private investor to buy back its shares.

5. The logo for BMW is easily recognizable. It consists of a black circle with the interior quartered and the sections within are blue and white. Many people mistakenly believe that the logo represents a spinning propeller, but that is not the case. Blue and white are the national colours of Bavaria.

6. One of the most distinctive features of a BMW is the grille, which is known as the kidney grille. This is one of the features that people notice when they see a car and instantly recognize it as being a car manufactured by BMW. Some people even find this a more recognizable feature than the BMW logo.

the terms of the Treaty of Versailles [veə'saɪ] – умови Версальського мирного договору;

kidney grille – фірмова решітка радіатора БМВ, які зовні подібні до нирок людини.

2. Find a word or expression in the text which is similar in meaning to:

a) to officially prevent (someone) from doing something (fact 2); b) the main offices of an organization (f3); c) the history, traditions of a company that exist from the past and continue to be important (f 3); d) to take control of a company (f 4); e) to be unable to pay (f 4); f) a person or organization that puts money into something to make a profit (f 4); g) a small picture or design that a company uses as its symbol (f 5); h) a screen of metal bars, placed in front of something as protection or to allow ventilation (f 6).

3. Discuss whether the statements are true or false. Correct the false ones.

1. BMW is said to be the best-known truck manufacturing company.
2. Bavarian Motor Works was founded in 1916 in Germany.
3. During WWI the company manufactured only motorcycles and cars.
4. There was a time when BMW almost became Mercedes in the late seventies.
5. The logo of BMW represents the national colours of Bremen, Germany.
6. BMW's headquarters are shaped like car parts.
7. The most distinctive features of a BMW are the grille and the logo.

4. Complete the statements with the appropriate information from the text.

1. BMW is a
2. It is synonymous with
3. BMW stands for
4. It was founded in
5. It started out by
6. There was a difficult period in BMW's history when
7. It is headquartered in
8. The logo for BMW is... . It represents... .
9. The most distinctive features of a BMW are

Самостійна робота № 6

Theme Car Logos and Manufacturers. Honda Motor Company.

Task to read the text, to do lexical exercises, to learn active vocabulary.

1. Complete the text with the correct forms of the verbs. Use the Present or Past Simple Active or Passive.

Honda Motor Company LTd ____ (to be) a Japanese multinational company mainly known for its cars and motorcycles. It's the sixth-largest carmaker in the world. The company ____ (to start) by a mechanic Soichiro Honda. He ____ (to make) small motorbikes after WWII and by 1964 had become the world's largest manufacturer of motorbikes. Honda also ____ (to manufacture) garden equipment, boat engines, power generators and jet engines. Since 1986, the company has been involved with robotics research. It ____ (to develop) what ____ (to be) today the world's best-known robot – the ASIMO – in 2000. Honda also heavily ____ (to involve) in motorsports and ____ (to have) racing teams in both Formula I and motorbike events. Honda's slogan ____ (be) "The Power of Dreams". Its website ____ (to say): "Dreams ____ (to inspire) us to create innovative products that ____ (to enhance) mobility and ____ (to benefit) society.

2. Complete the sentences with the correct forms of the verbs. Use the Past Simple or Present Perfect Active.

1) Cars always ____ (to play) a big role in the development of the economy and industry as well as lifestyle and culture. 2) In 1997 Toyota ____ (to introduce) its four-passenger Prius hybrid to the Japanese market. 3) Brakes themselves ____ (not to change) much since the introduction of disc brakes, but braking control systems ____ (to make) brakes safer and more effective. 4) luxury carmakers like Mercedes-Benz ____ (to begin) to use modern airbags in the 1980s, and Ford ____ (to make) airbags standard on all its vehicles in 1990. 5) The idea of creating environmentally-friendly cars ____ (to become) a 'hot topic' over the past few decades. 6) In 2010 General Motors ____ (to introduce) the Chevrolet Volt, a car that ____ (can) drive up to about 35 miles on electric batteries. 7) Automobile production in the USA ____ (to begin) in the 1890s. It ____ (to be) Henry Ford who ____ (to start) producing cars on an assembly line. 8) Since 2003 the number of accidents on UK roads ____ (to fall) by 37%, while the fatality rate ____ (to reduce) by more than a half. 9) Volvo always ____ (to be) a car safety pioneer. 10) Airbags ____ (to save) tens of thousands of people since 1991. 11) Renault ____ (to begin) to produce its own engines independently in 1903. 12) Since 1937 Toyota ____ (to make) more than 200 million cars in Japan. 13) The Beetle ____ (to come) to the U.S. in 1949, where it ____ (to become) known as a simple car with a very unusual look.

3. Choose a car manufacturer and use the Internet to gather information about it. Give a short presentation on your research or prepare a three-minute report on the car manufacturer you have chosen. Listen to feedback from others in your group. Here are some questions to investigate:

- What kind of company is it? What is it known for?
- When and where was it founded? What was the first product manufactured by this company?
- Where is the company headquartered?
- What are the most distinctive features of its vehicles?
- What does the logo represent? What is the story behind the logo?
- What is the slogan of this company?
- What are the best-selling cars of this maker?
- What interesting facts have you found out about this company and its cars?

Самостійна робота № 7

Theme Buying a New Car.

Task to read the text, to do lexical exercises, to learn active vocabulary.

1. Buying a new car can be exciting, but also a complicated process. There are plenty of things to consider when you decide which car is right for you. Match the questions with the answers to make mini dialogues.

2. How much do you like driving?	A. I would go to a dealer.
3. What kind of car would you like to have?	B. Not at all, I'd rather have a powerful engine.
4. Where would you shop for a new car?	C. Normally 2, sometimes 3.
5. Do you care about CO2 emissions?	D. Exotic, like a Ferrari.
6. How many passengers do you need to carry?	E. I drive everywhere, all the time.
7. What kind of driving do you mostly do?	F. Next to me with the wind in his face.
8. How much money would you spend on a car?	G. Like? Driving is my life!
9. If you had a dog, where in your car would it sit?	H. Any amount, as long as I love the car!

2. Work in pairs. Ask and answer the questions in Exercise 1. Give answers that are true for you. Answer some more questions.

- How often would you drive?
- How much cargo (stuff) would you carry in your car?
- Do you have bikes or other sports equipment to transport?
- Do you live in an area with bad weather or difficult driving conditions?
- Would you need to tow a trailer?
- Are you on a tight budget?
- Are you looking for a car with great fuel economy?
- What are your must-have features (leather seats, backup camera)?
- How much garage or parking space do you have?
- Would you use children's car seat?
- What is more important to you: fuel efficiency or safety?
- Do you like the wind in your hair?

3. Complete the text below with the names of body types (1-7). Mind the pronunciation of these words.

coupe ['ku:peɪ], estate [ɪs'teɪt], hatch back ['hætʃbæk], pick up ['pɪkʌp], suv
[ˈes ju:ˈvi], sedan [sɪ'dæn], convertible [kən'vɜ:təbl].

Car bodies have come in many different types. In the early days, most cars were open, without a fixed top. Now, in addition to _____, most cars are closed. The most common styles include coupes and sedans. A _____ is a two-door car with a small back seat. A _____ usually has four doors and seats for four or five people. It is one of the most popular styles because it is good enough for adults to sit comfortably. A car with a hatch-type rear door that can be lifted up to allow things to be put in is called a _____. It is similar to an _____, however, the latter is longer and is more likely to have the roofline extended to the rear of the car to maximize the cargo space. By the end of the 20th century, however, they have been mostly replaced by minivans and _____. The latter have multiple rows of seating, and can usually drive off-road. A _____ is a vehicle with an open part at the back in which goods can be carried.

Самостійна робота № 8

Theme Buying a New Car. Benefits and drawbacks of buying a new or used car.

Task to read the text, to do lexical exercises, to learn active vocabulary.

1. Read the text and be ready to discuss benefits and drawbacks of buying a new or used car, with an automatic or manual gearbox.

When it comes time to buy a car, you have a variety of choices available to you. Not only do you need to make (e. g. Toyota) and model (e. g. Camry) of your car, you can also need to decide if you want to buy a new or used car. Of course, there are benefits and drawbacks on both sides. The advantage of buying a new car is that you are buying a car that generally comes with a warranty. Most new cars will have very few repairs in the first years, so you can focus only on the maintenance of the car. Another advantage is that the new cars will have the latest technology, which will mean that you may find cars with better gas mileage and lower emissions.

If you decide to buy a used car, there is a chance to come in contact with at least one automobile that was in an accident. The most important thing about buying a used car is that you know everything about the history of the car, including:

- the number of the previous owners,
- if the car was ever involved in an accident,
- any previous mechanical problems,
- the maintenance history of the car.

One of the largest benefits of buying a used car is that you can get a great deal and, in many cases, the car you buy may even be relatively new.

The next important decision you'll have to make is to get an automatic or manual gearbox on your car? In a car with a manual transmission, the driver uses a clutch and gearshift to change gears. An automatic transmission shifts gears automatically, depending on how fast or slow the car is being driven. When a car reaches the maximum speed for a particular gear, the transmission shifts into a higher gear. When a car slows down, the transmission shifts into a lower gear. While a manual transmission will give you more control over the vehicle and may enhance the driving experience, an automatic is easy and convenient. If you don't enjoy driving and see a car as a means of getting from A to B, then you should buy a car with an automatic gearbox. If you love the open road and dream of buying a two-seat sports car to roar off into the distance, then you might want to consider buying a car with a manual gearbox. Cars with an automatic gearbox are generally more expensive to buy than the equivalent car with a manual gearbox.

2. Find a word or expression in the text which is similar in meaning to:

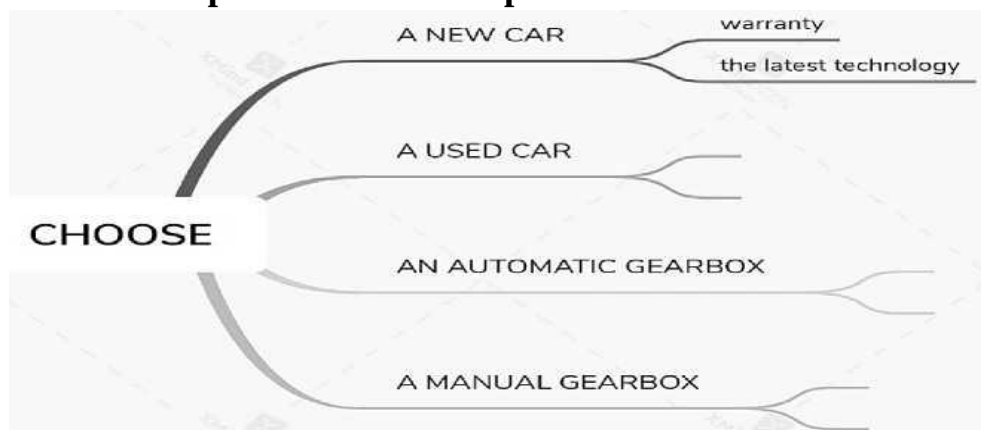
a) a type of product or the name of the company that made it; b) a particular design or version of a product; c) a written guarantee promising to repair within a particular period of time; d) the process of keeping something in good condition; e) the

act of fixing something that is broken or damaged; f) the number of miles that a vehicle can travel using a particular amount of fuel; g) the production of something, especially gas or radiation; h) to buy something at a good price; i) a metal box containing the gears in a vehicle; j) to move at high speed making a lot of noise.

3. Complete the sentences with words or expressions from ex. 7 in the appropriate form.

1. My uncle returned to the car park after shopping just in time to see his car pull away and ____ at great speed. 2. The car comes with a three-year _____. 3. Honda cars have low _____ and great _____, and they are very reliable. 4. The company introduced their latest _____ at the Motor Show. 5. This engine is offered with a choice of five-speed manual or four-speed automatic _____. 6. Regular preventive _____ is probably the single thing you can do as a car owner to save money on _____ in the future. 7. I am lucky, I _____ on these winter tyres.

4. Complete the Mind Map with the information from the text.



5. Make up the word combinations from columns A and B and find their equivalents in C.

A	B	C
1) high torque	a) consumption	вартість при перепродажі
2) resale	b) range	екологічно сприятливий
3) limited	c) requirements	зарядна станція загального користування
4) environmentally	d) charging station	витрата палива
5) public	e) value	високий крутний момент на низькій швидкості
6) fuel	f) at low speed	витрати на паливо
7) maintenance	g) friendly	вимоги згідно технічного обслуговування
8) fuel	h) costs	обмежена дальність ходу (автомобіля)

Самостійна робота № 9

Theme Buying a New Car. Traditional petrol and diesel-powered cars, electric and hybrid cars.

Task to do lexical exercises, to learn active vocabulary.

1. Let's look at the differences between traditional petrol and diesel-powered cars, and electric and hybrid cars. Run through the pros and cons of these vehicles.

Vehicle type	Pros	Corns
<u>Petrol-powered cars</u>	✓ cheap to buy ✓ petrol is cheap and easy to refuel and repair ✓ a smoother drive	- less efficient than diesel vehicles (consume more fuel) - higher levels of CO2 emissions
<u>Diesel-powered cars</u>	✓ less fuel consumption, especially over longer distances ✓ more reliable than petrol cars ✓ lower CO2 emissions than petrol cars ✓ good for towing, as they offer lower speed torque	- more expensive to buy and maintain - not great for driving in cities
<u>Hybrid cars</u> (have a petrol engine and a battery)	✓ environmentally friendly ✓ cheap to run ✓ longer range than electric cars ✓ no need to plug them in ✓ higher resale value than petrol and diesel cars	- more expensive than petrol and diesel cars - performance isn't as good as petrol and diesel cars - less choice of models - more expensive to repair and service - not as environmentally friendly as purely electric cars
<u>Electric cars</u>	✓ no pollution ✓ cheaper to run ✓ quiet and easy to drive ✓ charge them up from a normal plug at home, or a public charging station ✓ minimal fuel costs - electric cars have low maintenance requirements	- can be expensive to buy - can take hours to charge up - less choice of models - limited range before they run out of power - lack of charging stations - lower battery life in

	with fewer moving parts	winter, due to the need for lights and heating
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2. Discuss whether the statements are true or false. Correct the false ones.

1. Both petrol and diesel-powered cars need filling up with fuel at the petrol station.
2. A hybrid car is the best option if you want to move on from a petrol or diesel car, but aren't ready for an electric car.
3. Petrol engines don't emit much carbon dioxide.
4. Diesel cars are environmentally-friendly.
5. Petrol engines are considered more reliable than diesel ones.
6. Hybrid cars are 100% emission-free.
7. Hybrid cars are good for long distances.
8. One of the first things you'll notice about driving an electric car is the lack of noise.
9. It takes less time to charge an EV than to fuel a conventional car.
10. Electric cars don't burn any fuel, so they don't produce emissions.
11. You need to charge an EV only at a public station.
12. There's no fuel tank on an electric car, so if the battery dies, you're out of luck.

3. What is the most important thing to consider when you buy a used car? Rank them 1–8. (1 = most important)

Price, make and model, condition (used or new), warranty, mileage, size, special features, the car's history of accidents or repairs.

Самостійна робота № 10

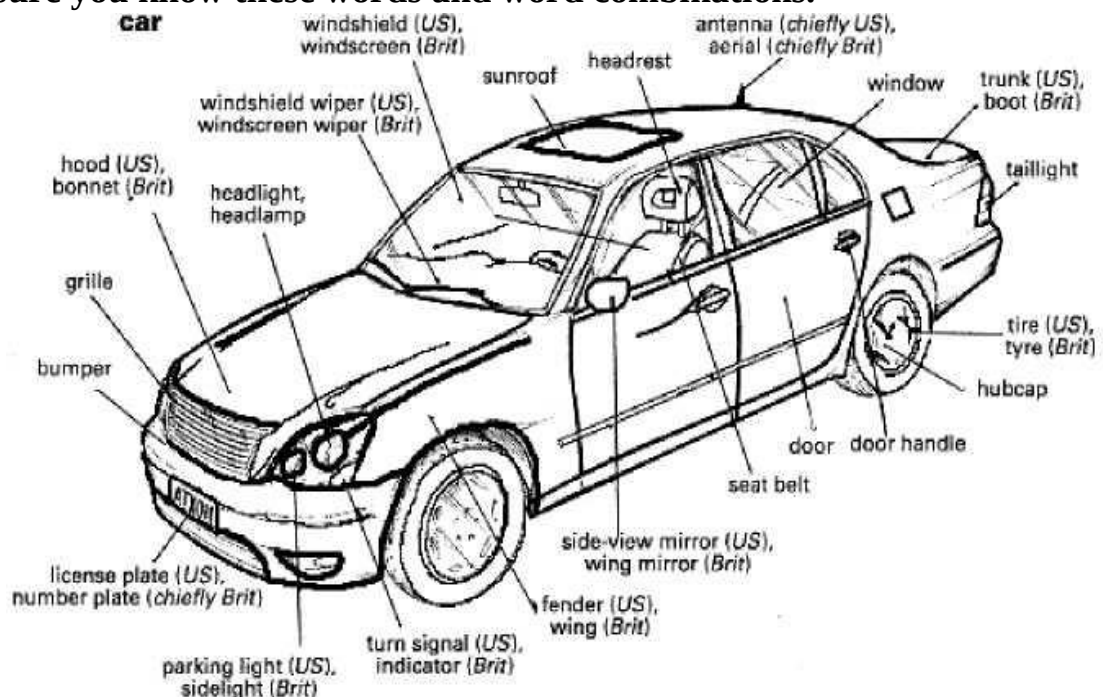
Theme Car Exterior Inspection.

Task to do lexical exercises, to learn active vocabulary.

1. Discuss the questions below in pairs.

- ✓ How important is the car appearance to you?
- ✓ Do you think the appearance is a reflection of your lifestyle (a mode of self-expression, a status symbol)?
- ✓ Does the car appearance reflect the mechanical condition of the car?
- ✓ Would you buy a car if you didn't like its appearance but you liked its price?
- ✓ Do you agree with the statement: the older the driver, the more car appearance matters?
- ✓ Can you identify the make and model of a car by having a look at the car?

2. Make sure you know these words and word combinations.



3. Read the definitions below. Guess what parts of a car they define.

- 1) a long thin piece of metal with a rubber edge that moves across a windscreen to remove rain;
- 2) a device for absorbing shock or preventing damage (in a collision);
- 3) a powerful light at the front of a motor vehicle;
- 4) a sign on the front and back of a vehicle that shows its registration number;
- 5) a glass screen at the front of a motor vehicle;

- 6) a flashing light on a vehicle to show that it is about to change lanes or turn;
- 7) an enclosed space at the back of a car for carrying luggage or other goods;
- 8) the front part of a car which covers the engine;
- 9) a part of a car roof that can be opened to allow air and light from the sun to come in;
- 10) one of the four parts at the side of a car that goes over the wheels;
- 11) a mirror on the outside of a car door that allows the driver to see the vehicles that are behind or trying to pass.

4. Make up the word combinations from columns A and B and find their equivalents in C.

A	B	C
1) car	a) damage	запасне колесо
2) spare	b) spot	ключ для гайок кріплення колеса, балонний ключ
3) frame	c) absorber	пляма іржі
4) tire	d) wrench	амортизатор
5) rust	e) panel	покриття фарбою
6) shock	f) inspection	ніша колеса
7) paint	g) light	гумове ущільнення
8) lug	h) seal	огляд автомобіля
9) rubber	i) tire	фара заднього ходу
10) reverse	j) finish	панель кузова
11) body	k) wear	пошкодження рами
12) wheel	l) well	зношення шини

Самостійна робота № 11

Theme Car Exterior Inspection of Used Car.

Task to read the text, to do lexical exercises, to learn active vocabulary.

1. Skim the text and match the headings (A–F) with the paragraphs (1–6).

- A. ON EVEN GROUND, CHECK OUT THE SUSPENSION
- B. CHECK THE CONDITION OF THE BODY
- C. ARE THE LIGHTS AND LENSES IN GOOD CONDITION?
- D. TAKE A LOOK AT THE GLASS
- E. IF POSSIBLE, CHECK THE EXHAUST SYSTEM AND UNDERNEATH THE CAR FOR RUST
- F. TIRES TELL A STORY OF THEIR OWN

1. The first thing to do in a used car inspection is to examine each body panel, as well as the roof. Take note of any rust spots, dents, and scratches. Look closely at the gaps between the panels (e. g. between the fenders and the doors). If the gaps are uneven, this usually means they were assembled poorly in the factory, or the vehicle was poorly repaired. Also, ensure the color and paint finish are the same on each panel. Next, using a flashlight, take a look inside of the wheel wells for rust. Lastly, open and close all of the doors, as well as the hood and trunk. Inspect all rubber seals around the doors and windows for tearing.

2. Walk around the vehicle and take a careful look at all the glass to make sure there are no cracks. Cracks will only get worse and can require an expensive repair later.

3. Another essential thing to check in a used car inspection is the suspension. Stand back from the car and see if it's sagging anywhere. Push down on each corner of the car. If the shock absorbers are in good condition, the car should rebound only once. If the car continues moving up and down, there's something wrong.

4. Be sure to check all lights on the vehicle: turn signals, fog lights, brake lights, and reverse lights. Additionally, ensure that all lenses and reflectors are not damaged, or fogged with moisture.

5. Surprisingly, a lot of information about a car can be collected from the tires alone. Be sure to look closely at tire wear. What you don't want to see is uneven wear across the surface of the tire, as this suggests the vehicle may have a mechanical problem or that it hasn't been properly maintained. Make sure to check if all four tires are of the same type and size. Finally, check if the spare tire is in good condition and that all the tire changing tools are present (e. g. lug wrench, jack, etc.).

6. When completing a used car inspection, it's important to check the exhaust system. Check for black spots, which may signify leakage. While the engine is running, if it's not cold outside and there is a white vapor, this is also a bad sign. The final thing to do when performing a used car inspection of the car's exterior is to check the underbody for rust and any signs of frame damage.

2. Complete the table with the information from the text.

	Parts of a car	Common problems
1.	Body panel and roof	
2.	Doors	
3.	Windows	
4.	Suspension	
5.	Lights	
6.	Tires	
7.	Exhaust system	

3. Replace the words in italics with the words in bold from the text (Ex. 1).

1. Pay special attention to rust spots, wear, or defects in the material of the fuel tank.
2. Firstly, take a good look at the body colour under the bonnet.
3. Step back away from the vehicle 20 feet or so and look at it from all angles.
4. Don't forget to check the trunk. It should not have any rust spots or cracks that allow water in.
5. With your car parked safely, push down firmly on the boot, the vehicle should bounce back and settle in place after one bounce.
6. Glass in windows must have no holes or cracks, mirrors must be clean and unbroken.
7. A badly fixed car represents a health and safety hazard.
8. Generally, a warning light on your dashboard will indicate that something is faulty in your vehicle.

4. Give the English equivalent of the words in brackets.

1. Most (шини) will last for four years with normal (вмятина).
2. She ran into my car and put a (вмятина) in it.
3. I looked under the (капот) and clouds of smoke poured out.
4. Stolen goods were found in the (багажник) of her car.
5. The car windows were (запотіти).
6. The (нешкідливий для навколишнього середовища) car (also known as a green car) is a vehicle that emits low carbon compounds when it runs.
7. Contact between the (крило) and (колесо) could cause the rider to lose control.
8. You need a (домкрат) in order to change a tyre.
9. Diesel (двигуни) can (працювати) on the fuel without being converted.

Самостійна робота № 12

Theme Car Exterior Inspection of Used Car.

Task to read the text, to do lexical exercises, to learn active vocabulary.

1. Use phrases below to describe the whole process of a used car inspection.

Firstly / First of all...

After that....

The next step is....

Additionally..../ Then....

Following that....

Next....

Finally..../ The final step..../ The final thing to do is to...

2. Before buying a car, you should always try and test drive it. Arrange the words in the proper order to make questions you should ask yourself during the test drive.

1) the engine / does / of / start / the car / instantly?

2) comfortable / the car / is / to drive?

3) quiet / the engine / and / is / smooth?

4) the gears / to find / are / all / and / easy / engage?

5) handle / of / does / well / on / types / different / it / road?

6) easily / the driver's / adjust / steering / are / able / seat / and / you / to / wheel?

7) the brakes / to make / smooth / do / allow / you / stops?

3. Put the verbs in brackets in the correct form using the Past Simple or Past Continuous Tense (Active Voice).

Police in the Northern California 1 ____ (arrest) a man who 2 ____ (travel) on a road near San Francisco early Friday morning while sleeping behind the wheel of his Tesla Model S. At 3.40 a.m. police officers 3 ____ (notice) that the electric luxury sedan 4 ____ (drive) at 70 miles per hour, above the speed limit. When the officers 5 ____ (drive up) next to the vehicle and 6 ____ (look) inside, they 7 ____ (see) that the driver 8 ____ (sleep) in the driver's seat. The officers 9 ____ (turn on) their car's warning lights and siren but the driver 10 ____ (not/wake up). In order to stop the sleeping driver's Tesla, the officers 11 ____ (block) traffic behind the vehicle. While another officer 12 ____ (travel) in front of the speeding Tesla, he gradually 13 ____ (start) to slow down his car, forcing the semi-autonomous Tesla, which can respond to varying traffic speeds, to a complete stop. After that, the officers 14 ____ (can) wake the

driver and 15____ (place) him in a patrol car. The car owner was arrested on suspicion of driving under the influence (керування автомобілем під дією наркотиків чи в стані алкогольного сп'яніння).

4. Imagine you would like to sell your car. Write a brief (three to four-line) description using the text below as a model. Include information about the age and condition of the car, price, and contact information. Exchange your description with a partner.

2013 Volkswagen Beetle 1.2 Design Convertible

2 Owners ABS Adjustable Steering Column Air Conditioning Alloy Wheels Auto Lighting Auxiliary in Bluetooth CD Player Central Locking Climate Control Cruise Control Electric Windows Full Service History Multi-Function Steering Wheel Non Smokers Car Parking Sensors PAS Power Hood Trip Computer.

2011 60 Hyundai iX 20 1.4 Blue drive Style 5 Door MPV

White, 57000 Miles, 2 Previous Owners, Service History, Remote Central Locking, Electric Windows, Electric Mirrors, Sunroof, ABS, Air Conditioning, Power Steering, Drives Airbag, Passenger Airbag, Cruise Control

2013 13 Chevrolet Spark 1.2i LT 5 Door Hatchback

Green, 21275 Miles, 2 Previous Owners, Full Service History, Remote Central Locking, Electric Windows, Power Steering, Drivers Airbag, Passenger Airbag, Alarm Immobilizer.

Самостійна робота № 13

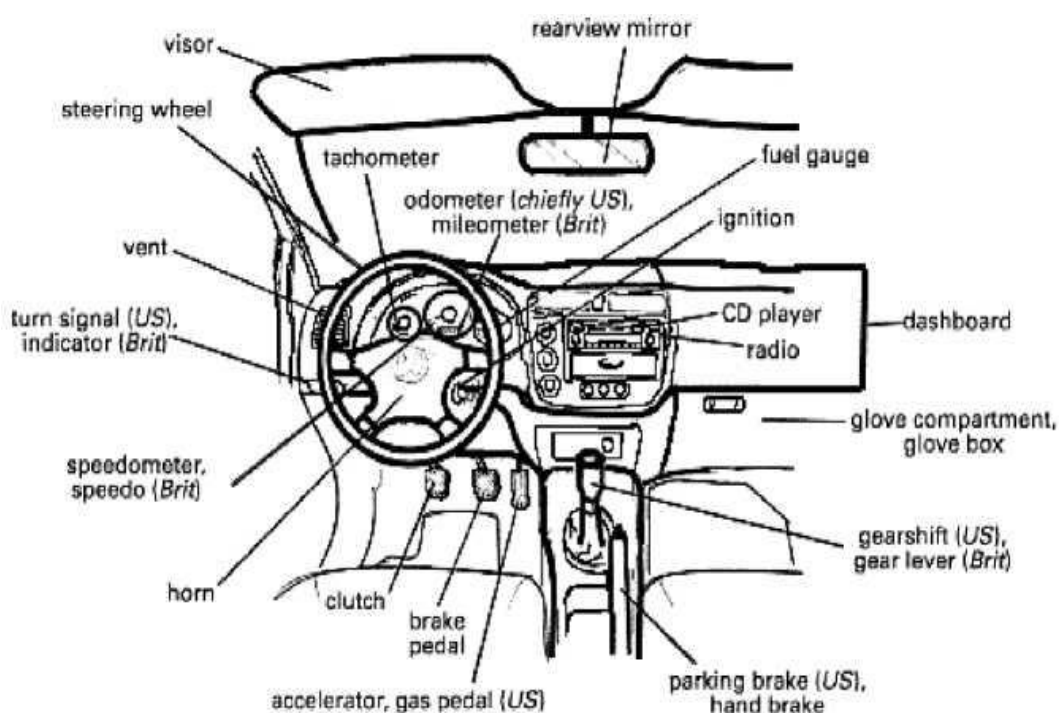
Theme Comfortable driving.

Task to read the text, to do lexical exercises, to learn active vocabulary.

1. Discuss the questions below in pairs.

- ✓ What does driving comfort mean?
- ✓ Do you agree that comfort starts with the seats?
- ✓ Do you agree that comfortable car seats are like comfortable shoes – what's comfortable for me, may not be for you?
- ✓ What other features make drives much more comfortable (heating, ventilation, climate control, cruise control, etc.)?
- ✓ Would you like to have a powerful sound system in your car?

2. Make sure you know these words and word combinations in order to complete the sentences below.



1. The driver uses ____ to make the car go in a certain direction.
2. The driver presses ____ to slow down or stop the car.
3. There are two types of transmission – manual and automatic. You use ____ to change the power of the car's engine.
4. You put on ____ when you park your car so that it doesn't move by itself. It's situated between the driver's and passenger's seats.
5. The driver presses ____ to speed up.
6. In the middle of the steering wheel, we often find _____. You press it to make a loud sound to alert other drivers.
7. When you want to change gears you press _____.
8. ____ enables the driver to see the vehicle or road behind.
9. ____ is used for storing small items.
10. ____ is used to maintain a cool atmosphere in warm conditions.
11. ____ is an information centre. It supplies data on fuel, speed, time, and engine-operating conditions. It can also give information on the inside and outside temperature.
12. ____ tells you the rate at which the car is travelling. The rate, or speed, is reported in miles per hour (mph) or kilometres per hour (km/h or kph).

3. Make up the word combinations from columns A and B and find their equivalents in C.

A	B	C
1) spacious	a) handling	бокова підтримка (валиками спинки сидіння)
2) long-distance	b) running	оббивка салона
3) lower	c) trip	поперекова частина спини
4) interior	d) seat	дорожній просвіт, кліренс
5) fabric-trimmed	e) vehicle	просторий автомобіль
6) smooth	f) isolation	далека поїздка
7) ground	g) support	сидіння з тканинною оббивкою
8) noise	h) back	плавний хід
9) lateral	i) trim	шумоізоляція
10) excellent	j) clearance	відмінна керованість

Самостійна робота № 14

Theme Comfortable driving. Safety Systems.

Task to read the text, to learn active vocabulary.

Modern cars have lots of safety systems. Airbags and seatbelts may seem obvious, but they can also have more advanced technologies such as Anti-lock Braking Systems, Electronic Stability Control, and Autonomous Emergency Braking. How do you know what your car has?

Anti-lock Braking System

Around since the 80s, ABS prevents the car's wheels from locking up in a braking emergency. This stops the car from uncontrollably skidding, reduces the stopping distance, and enables the car to be steered during braking. So how can you tell if your car has ABS? As you turn on the ignition, the lights on the dash illuminate. If your car has ABS, this symbol will light up. Making the most of the ABS requires the driver to quickly apply full pressure to the brakes and hold the pressure until the car comes to a stop. The car may make grinding or thumping noises as ABS is engaged. However, this is to be expected.

Electronic Stability Control

Many cars have electronic stability control or ESC. Depending on the make of your car, this could be identified as DSC, ASC, ESP, or a number of other names. ESC uses sensors to monitor the attitude, steering, and throttle opening of the car by cutting the power to the engine and automatically applying brake pressure to individual wheels, ESC can correct a slide or help prevent the car from rolling after a sudden swerve. If your car has ESC, you will see this symbol when you turn on the ignition. If the ESC intervenes, the light will turn on as an indication that the car has lost traction. Most cars have a button that allows you to turn the ESC off. You should only turn off the ESC in rare situations such as starting off on very slippery surfaces such as mud, or ice. When the wheels may need to spin to get the car moving, the ESC light will stay on as a warning until reactivated.

Traction control

ESC and Traction control are often confused. Traction control while the part of ESC only prevents wheel spin under acceleration.

Autonomous Emergency Braking

Autonomous Emergency Braking or AEB can be known as city brake or collision avoidance. This is a relatively new technology that uses laser, radar or camera

technology or a combination of all three. AEB automatically breaks the vehicle to prevent a crash at low speeds. Some 65 systems can reduce the collision impact at higher speeds. A car with AEB can be identified by a variety of sensors usually found in the windscreen, grille, bumper, or video cameras in the back of the rearview mirror. Often accompanying AEB is a forward-collision warning system involving visual and audible alarms.

Airbags

Some vehicles have as many as 13 airbags servicing different areas of the car. Frontal airbags can be easily identified by SRS or airbag badges on the steering wheel or passenger dash panel. Some cars may have a knee bag under the steering column on the driver's side that helps prevent lower leg injury. Airbags can also be in the front seats for the doors and there are curtain airbags that deploy from along the top of the side window to help prevent head injuries in a side collision. These are also identified by SRS emblems and tags.

Active seatbelts

Active seatbelts retract mechanically or explosively in order to reduce the amount of slack in the seatbelt immediately after a collision but before activation of the airbag. Active belts are identified by tags or stickers at the base of the buckle

Самостійна робота № 15

Theme Comfortable driving. The most comfortable cars.

Task to read the text, to do lexical exercises, to learn active vocabulary.

1. Read the text about the most comfortable cars for a long trip.
 - ✓ Which adjectives from the text would you use to describe a car?
 - ✓ Which of these cars would you like to drive? Give reasons.

If you spend a lot of time in a car, you probably know that comfort during trips is the most important thing. In case the car is not comfortable, then long trips usually cause fatigue and irritation. Unfortunately, not all car brands can boast of comfort and convenience.

Nevertheless, there are models that have a huge advantage over other brands in terms of comfort. So, analysing the car's driving comfort, noise isolation, the comfort of the driver's seat and the front passenger seat, we've selected the most comfortable cars for long-distance trips...

Audi A6 is a very convenient and *spacious* vehicle. Travelling by this car will please even the most *experienced* driver or passenger. The interior comfort of Audi A6 is better than in other Audi models. The cabin is quiet, even at a speed of 100 km/h. The engine sound and the road noise are barely *audible*. Ideally designed front seats will not let the driver and the passengers get tired even during a long-distance trip. **Chevrolet Impala** is a sporty-style business sedan with a roomy, *comfortable*, and quiet interior, and excellent handling. Large and spacious front seats also attract attention. They are pleasant to the touch and perfectly support the lower back, which allows you to travel long distances with comfort.

Ford Mondeo offers the maximum comfort both for the driver and passengers. The vehicle is quiet. The noise comes only from the ventilation of climate control. Also, some noise will bother you a few minutes after starting the engine in cold weather. After warming up, you won't hear the sound of the motor. The front seats are very comfortable thanks to the support of the lower back. It's worth noting that the leather seats hold the back much better than the fabric chairs. Plus, fabric-trimmed seats are somewhat stiffer than leather seats, which can lead to fatigue during long trips in traffic jams.

Lexus ES provides *complete* silence in the cabin. Even at high speed, you will not hear the sound of the wind. The interior of Lexus ES is modern and thought through to the smallest detail. The comfort of the car is *incredible*. *Luxurious* interior trim pleasantly surprises with its textures. ES models feature very quiet engines and excellent noise insulation. Seats are distinguished by their comfort due to their width and balanced softness.

Volkswagen Tiguan provides great convenience for the driver and passengers. Tiguan will not cause any worries on all road types, because the ground clearance is quite large. Sound insulation is *fantastic*. The *smooth* running of the car and excellent handling are the main advantages of this model. All seats are very comfortable.

Mercedes-Benz GL. This model of Mercedes is the most *suitable* SUV for a longdistance trip. High-quality interior trim, perfect functionality, and great convenience won't leave *indifferent* even the most obvious critics of Mercedes cars. The front seats are spacious and wide in size. But despite this, a driver and front passenger will feel comfort even at high speed thanks to the lateral support. A comfortable car is a key to a successful trip. If you and your passengers feel good, then you are guaranteed to get positive emotions.



2. Read the text again. Find adjectives in italics with the following meaning.

a) very comfortable and expensive; b) difficult to believe, extraordinary; c) right or appropriate for a particular person; d) bulky, large and roomy; e) calm or gentle in movement; f) rigid and hard, not easily changed in shape; g) providing physical ease and relaxation; h) making little or no noise; i) entire, full; j) extraordinarily good; k) having no particular interest; l) having skill because you have done something many times; m) able to be heard.

3. Paraphrase the following sentences using the underlined expressions from the text.

1. The front seats are soft and convenient. Special pillows provide excellent back support.
2. Various conveniences, luxurious items, and silence won't let you get tired while driving Chrysler 300.
3. Volkswagen Tiguan provides great convenience for the driver and passengers.
4. Even at high speed, you will not hear the sound of the wind.
5. SUV is a very suitable car for off-road journeys. It offers high ground clearance.
6. This minivan being small outside is quite capacious inside.
7. Subaru Forester impresses with its reliability, excellent handling, and a significant engine resource.
8. Honda CR-V is able to meet the needs of the most demanding drivers regarding the comfort.
9. It is essential to know that SUVs also offer the best ride on bad roads.

Самостійна робота № 16

Theme Comfortable driving.

Task to read the text, to do lexical exercises, to learn active vocabulary.

1. Read the text, translate it. Give the English equivalent of the words in brackets.

Mercedes-Benz E-Class

In addition to (безпека) and (надійність), E-class can also (вихвалятися) its comfort. Generally, Mercedes is one of the best cars in many parameters. Launching a new (покоління) of E-class, the Mercedes-Benz Company focused on comfort, functionality, and (зручність). Engineers of the German company have created a (підвіска) that will be soft even on a very bad road. The car is especially ideal on the (автомагістраль), where you will not hear the loud work of the (двигун) and the (шум) of the tyres. The front seats are large and comfortable (завдяки ідеальному розміру).

2. Complete the text below with the appropriate word.

Camera, card, innovative, consumption, seats, compact, airbags, button, parking, wheels, length, control

Kia Picanto is a tiny car with great opportunities. It is a city minicar of “A” class which is simple for 1 ____ on the loaded streets of the megalopolis. Outside it looks 2 ____ and sporty. Being only 3.6 meters in 3 ____, it contains a set of high-quality materials and technologies! Inside you will find a lot of useful devices and 4 ____ systems designed to make your trip comfortable, interesting, and safe. So, the car is equipped with: seven 5 ____, full-time parking sensors, a rearview 6 ____, climate 7 ____, multi-function trip computer, full power accessories, heated 8 ____, mirrors, windows and steering wheel, driver’s seat lift, alloy 9 ____, fog lights, cruise control, standard navigation system, and even a key 10 ____ to start the engine with a 11 _____. Fuel 12 ____ is 7.6 litres per 100 km on the road and 5 litres per 100 km on the highway.

3. Choose the right variant for each word combination.

a) shift paddles	1. “педаль в підлогу” при початку руху
b) gesture-control system	2. напоготові

c) to vaporize speed	3. масштабування (збільшення та зменшення) навігаційних карт
d) anti-roll bars	4. підрульові перемикачі
e) at the ready	5. адаптивна підвіска
f) zooming the nav map	6. гасити швидкість
g) adaptive M suspension	7. система керування жестами
h) next-gen	8. стабілізатор поперечної стійкості
i) audio volume	9. вдало розташований
j) WOT from a stop	10. наступне покоління
k) well sited	11. рівень гучності

4. Substitute the words in Ukrainian with their appropriate equivalents in English.

springs, fit and finish, brakes, steering, gauges and controls, seats, adjust, lag, all-wheel drive, noise levels, ride, engines, handling balance, dampers

The focus of BMW's designers and engineers was toward creating a next-gen X4 that looks and drives more like a coupe than an SUV. Did they succeed? Both the standard and optional adaptive M suspensions feature firmer (пружини), (амортизатори), and anti-roll bars than in equivalent X3s. The 30i's (гальма) provide excellent modulation, feel, and short stops. But the M Sport brakes are incredible in their ability to vaporize speed. The (рульове керування) still does not feel as linear as I would like, but the overall (їзда)/steering/ (збалансованість) is as advertised. Dynamically, the X4 doesn't drive like an SUV. Except for a slight (затримка) at WOT from a stop, the X4's 2.0-L turbo motor responds more like a powerful six. Likewise, the M40i's 6-cylinder performs like a V8. Both (двигуна) come with standard (повний привід) and a ZF 8-speed automatic with shift paddles at the ready.

The X4 provides exceptional comfort, well-sited (датчики і механізми контролю) and low (рівень шуму). (Сидіння) are comfortable and supportive. One of the M40i's I drove was equipped with BMW's gesture-control system, which can (налаштовувати) controls such as audio volume and zooming the nav map in and out. It needs more development. High-quality materials, and excellent (обладнання і оббивка) are found throughout the interior. And the central control screen can be programmed.

Самостійна робота № 17

Theme Comfortable driving.

Task to do lexical exercises, to learn active vocabulary.

1. Match the names of safety features to their definitions, translate the definitions and guess if they are active or passive safety systems:

2. Anti-lock braking system (ABS)	a) start braking automatically if a collision is likely to happen and the driver is not taking any action (or not fast enough)
3. Electronic stability control (ESC)	b) are cushions built into a vehicle that protect occupants from hitting the vehicle interior during a collision
4. Autonomous emergency braking (AEB) systems	c) help to prevent the wheels of a vehicle from locking when braking heavily, and enable the driver to keep steering
5. Airbags	d) are systems that hold you in your seat, in order to reduce the risk of being injured in an accident
6. Seatbelts (or safety belts)	e) helps to prevent a vehicle from skidding, and the driver from losing control while turning a corner

5. Match the English words with their Ukrainian equivalents.

1) uncontrollable skidding	a) датчик положення у просторі
2) stopping distance	b) некерований занос, ковзання
3) grinding or thumping noise	c) різке, раптове відхилення (від курсу)
4) attitude sensor	d) протибуксувальна система, регулювання тягового зусилля
5) steering column	e) бокове зіткнення
6) seatbelt buckle	f) подушка безпеки
7) throttle opening	g) рульова колонка

8) sudden swerve	h) відкриття дросселя
9) traction control	i) слизька поверхня
10) slippery surface	j) послаблення, провисання ремня безпеки
11) curtain airbag	k) замок ремня безпеки
12) seatbelt slack	l) гальмівний шлях
13) side collision	m)скреготливий звук

6. Complete the sentences with the verbs below.

prevent, turn on, monitor, reduce, deploy

1.The system can apply brakes and ____ a knee airbag if it senses that a frontal collision is likely to happen.

2. When you ____ the ignition and lights don't light up on the dashboard, it means that the energy doesn't get enough energy from the battery.

3. ESC uses sensors to ____ the attitude, steering, and throttle opening of the vehicle.

4. Pretensioners tighten and ____ slack in seatbelts to protect occupants from rapidly moving forward in the event of a crash.

5. Electronic stability control systems help ____ vehicles from skidding or rolling over when drivers need to steer hard or turn on slippery roads.

4. Describe a vehicle you would like to buy.

.... is a very and car.

It is a sedan / SUV / with a interior.

The front seats are and They will not let you

The car is equipped with such useful devices as

.... won't leave you indifferent.

You will not hear

It is worth noting that

The main advantages of this model are handling and

The car is packed with such safety features as .../ Its safety features include

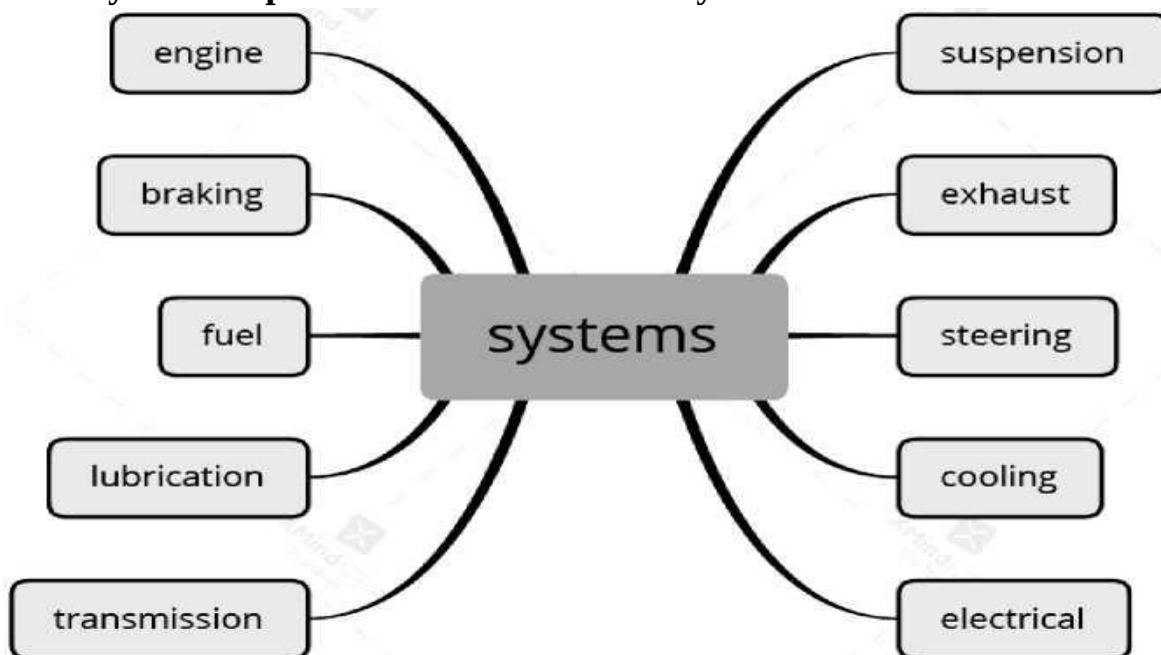
The car impresses with

Самостійна робота № 18

Theme Car Systems.

Task to do lexical exercises, to learn active vocabulary.

1. The modern vehicle is made up of a variety of parts and components assembled in systems to perform various tasks. They are:



Do you know which system:

- supplies the fuel to the engine,
- transmits the motion produced by the motor to the wheels,
- changes the direction of the car,
- reduces the vehicle's speed and keeps it in place while parked,
- removes excess heat from the engine,
- expels the burnt gases to the outside of the vehicle,
- supplies the necessary current for starting the vehicle and operating its electric accessories,
- uses the energy from liquid fuel or steam to produce movement,
- reduces friction between moving parts,
- reduces the effects of traveling over an uneven surface.

2. How much do you know about car systems? Work with a partner and complete this quiz.

1. A car engine's job is to:

- a) convert fuel into heat
- b) convert fuel into motion
- c) convert fuel into exhaust

2. Where are engine parts such as the pistons and cylinders housed in your car engine?

- a) engine block (cylinder block)
- b) side wells
- c) sump
- d) trunk

3. A car uses a four-stroke engine. The four strokes are:

- a) intake, compression, combustion and exhaust
- b) injection, rotation, combustion and exhaust
- c) injection, carburetion, rotation and exhaust

4. The fuel system of an engine takes fuel from a fuel tank and mixes it with what?

- a) more fuel
- b) electricity
- c) exhaust
- d) air

5. Fuel is transmitted along this to the engine. Which of these are we talking about?

- a) fuel tank
- b) fuel filter
- c) fuel line
- d) carburetor

6. What sort of fluid should you put in your car's radiator?

- a) Coca-Cola
- b) brake fluid
- c) motor oil
- d) coolant

7. The liquid used in the engine's lubrication system is ____.

- a) oil
- b) water
- c) fuel
- d) air

8. A car needs a source of electricity to power things such as the radio, wipers and headlights. Which engine part is responsible for this?

- a) alternator
- b) radiator
- c) starter

9. Which tool would you use to charge up a dead car battery?

- a) jumper cables

b) lug wrench

c) multi-tool

10. What does the oil filter in your engine do?

a) cleans impurities from the oil

b) pumps oil through the engine

c) stores reserve oil when it runs out

11. What car part moves coolant through the engine when it starts to get too hot?

a) oil filter

b) water pump

c) fuel line

d) none of the above

12. Dashboard warning lights tell us of potential problems in our vehicles. What does a red can with a droplet mean?



a) you are running out of fuel

b) your power steering fluid needs checking

c) you need to fill your brake fluid

d) your oil is running low, top it up immediately.

Самостійна робота № 19

Theme Internal Combustion System.

Task to read the text, to learn active vocabulary.

1. Read and translate the text.

Today the internal combustion engine is used in motorcycles, automobiles, boats, trucks, aircraft, ships, heavy-duty machinery, and powered generators. A four-stroke engine is an internal combustion engine in which the piston completes four separate strokes - intake, compression, power, and exhaust - during two separate revolutions of the engine's crankshaft, and one single thermodynamic cycle.

Let's take a look at the basic internal parts of a four-stroke engine. Inside the engine block, there is a crankshaft. Piston rods are attached to the crankshaft. Pistons are attached to the pistons' rods. As the crankshaft turns it causes the lifter to make each piston move up and down. At the top of the crankshaft there is a camshaft which is connected to the crankshaft by a timing belt. While the crankshaft is making the pistons move up and down, the camshaft is turning making the valves to open and close.

Let's now take a look at how the combustion creates piston's motion.

First, intake stroke. The inlet valve is opened and the fuel-air mixture is drawn in as the piston travels down.

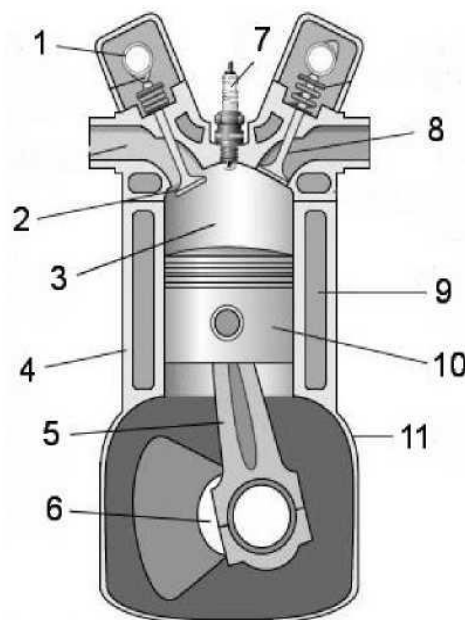
Second, compression stroke. The inlet valve is closed and the piston travels back up the cylinder compressing the fuel-air mixture. Just before the piston reaches the top of its compression stroke, a spark plug emits a spark to combust the fuel-air mixture.

Third, combustion stroke. The piston is now forced down by the pressure wave of the combustion of the fuel-air mixture. The engine's power is derived from this cycle.

Forth, exhaust stroke. The exhaust valve is opened and the piston travels back up expelling the exhaust gases through the exhaust valve. At the top of the stroke, the exhaust valve is closed.

This process is repeated. What has been presented is the cycle of operation of one cylinder of a four-stroke engine. Generally, engines have two or more cylinders acting in concert with each other to produce the engine power

Basically, the engines are of two types, and these are *external combustion engines* and *internal combustion engines*. Label the parts of a four-stroke engine and find out which parts of an internal combustion engine are located in the engine block.



Spark park plug, cooling water, camshaft, connecting rod, crankcase, exhaust valve, intake (inlet) valve, cylinder block, crankshaft, combustion chamber, piston

2. Read the text and fill in the gaps with the words.

valves, cycle, camshaft, compression, pistons, engine block, motorcycles

Today the internal combustion engine is used in 1 ____, automobiles, boats, trucks, aircraft, ships, heavy-duty machinery, and powered generators. A four-stroke engine is an internal combustion engine in which the piston completes four separate strokes - intake, 2 ____, power, and exhaust – during two separate revolutions of the engine's crankshaft, and one single thermodynamic 3 ____.

Let's have a look at the basic internal parts of a four-stroke engine. Inside the 4 ____ there is a crankshaft. Piston rods are attached to the crankshaft. Pistons are attached to the pistons' rods. As the crankshaft turns it causes the lifter to make each piston move up and down. At the top of the crankshaft there is a 5 ____ which is

connected to the crankshaft by a timing belt. While the crankshaft is making the 6 ____ move up and down the camshaft is turning making the 7 ____ to open and close.

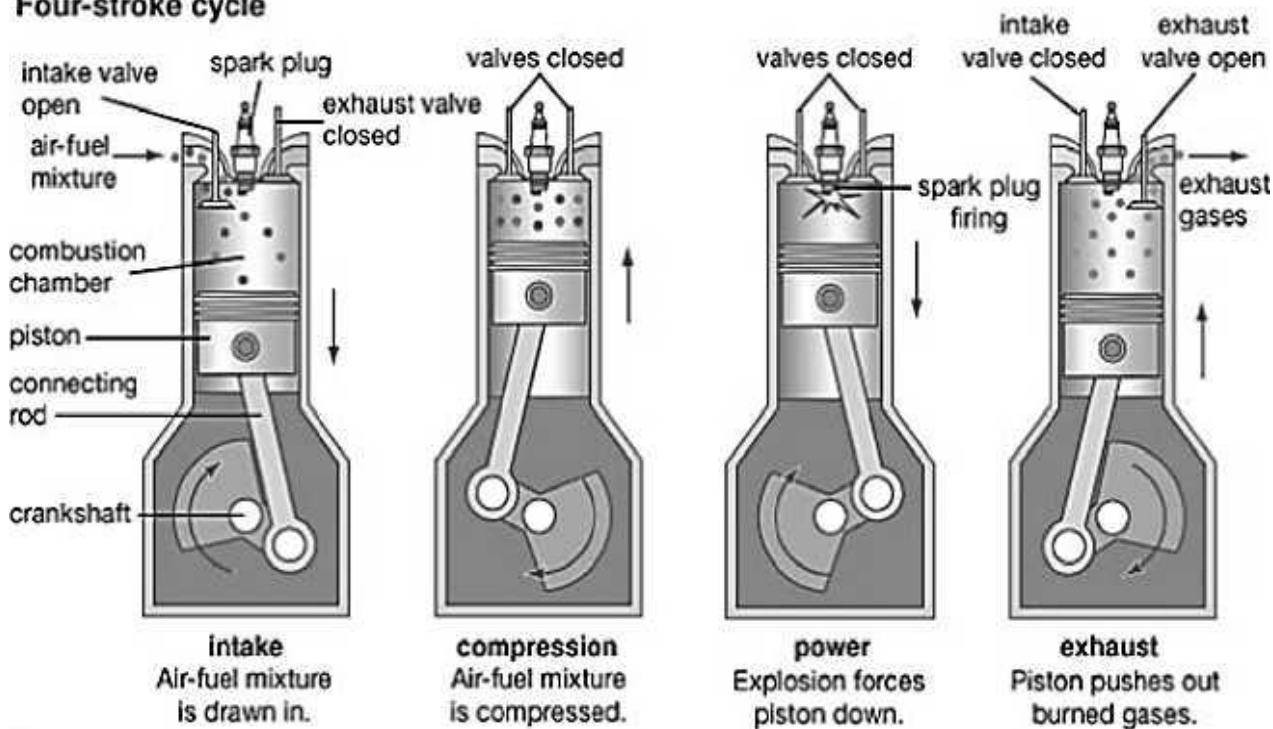
Самостійна робота № 20

Theme Internal Combustion System.

Task to read the text, to learn active vocabulary.

1. Take a look at how the combustion creates piston's motion. Match the names of four strokes to their descriptions.

Four-stroke cycle



1st INTAKE STROKE

2nd COMPRESSION STROKE

3rd COMBUSTION STROKE

4th EXHAUST STROKE

A. The inlet valve is closed and the piston travels back up the cylinder compressing the fuel-air mixture. Just before piston reaches the top of the cylinder, a spark plug emits a spark to combust the fuel-air mixture.

B. The exhaust valve is opened and the piston travels back up expelling the exhaust gases through the exhaust valve. At the top of the stroke, the exhaust valve is closed.

C. The inlet valve is opened and the fuel-air mixture is drawn in as the piston travels down.

D. The piston is now forced down by the pressure wave of the combustion of the fuel-air mixture. The engine's power is derived from this cycle.

**power stroke=combustion stroke=ignition stroke*

2. Find words or phrases in Ex. 3, 4, 5 which fit these meanings.

- 1) a rod that links a piston to a crankshaft;
- 2) a device that opens and closes to control the flow of fluid;
- 3) a substance that produces heat or power when burned;
- 4) the main part of an engine to which other parts are attached;
- 5) a device in an engine that produces an electrical spark that lights the fuel and makes the engine start;
- 6) a piece of metal that moves up and down inside a cylinder in an engine to press the fuel into a small space;
- 7) a case or covering enclosing a crankshaft.

3. Answer the questions.

1. What is an internal combustion engine?
2. What are the four strokes that make up a four-stroke engine cycle?
3. What burns within the engine to keep the combustion process going and the engine running?
4. Which two engine parts are linked by a timing belt to ensure they keep the valves and pistons in sync?
5. In which engine stroke does the combustion of the fuel/air mixture take place?

Самостійна робота № 21

Theme Types of Internal Combustion Engines.

Task to read the text, to do lexical exercises, to learn active vocabulary.

1. There are different types of internal combustion (I.C.) engine and the classification depends upon various basis. Complete the table with appropriate types of engine:

two-stroke, single cylinder, air-cooled, horizontally opposed, spark ignition, diesel, in-line, double cylinder, four-stroke, petrol, water-cooled, compression ignition, electric, V-type, gas, multi-cylinder

Basis	Engine Types
Air intake process	<i>naturally aspirated, supercharged, turbocharged</i>
Type of fuel	
Number of strokes	
Layout of engine	
Type of ignition	
Number of cylinders	
Types of cooling	

2. Read the definition below. Guess types of I.C. engines they define.

1. In this engine, the cylinders are arranged at an angle. The angle between the cylinders has a 'V' shape.
2. The engine in which the piston does two times motion to produce a power stroke.
3. The engine that uses diesel for its operation.
4. The engine that takes in air at the atmospheric pressure.
5. In this engine, there is a spark plug that produces spark and ignites the air-fuel mixture for the combustion.
6. The engine which consists of two cylinders.
7. In these engines, the air is used to cool the engines.
8. The cylinders are arranged in two banks on opposite sides of the engine.
9. It is an eco-friendly engine. It doesn't use any fuel to burn.
10. It has all of the cylinders next to each other in a single bank.

11. In this engine, there is no spark plug at the cylinder head. The fuel is ignited by the heat of the compressed air.

3. Make up a dialogue in which one student consults the second student on the types of engines.

A: Could you explain me the difference between the air-cooled engine and the water-cooled engine?

B: Well, it's rather simple. In the air-cooled engines, while in the water-cooled engines

3. Read the text and find out what the numbers and abbreviations stand for?

Mercedes-Benz CLA 180 is an automobile that has a 4-door sedan / saloon body style with a front mounted engine driving through the front wheels. The Mercedes-Benz CLA 180's engine is turbocharged petrol, 1.3 litre, 4 cylinder. It develops 134 bhp¹ (136 PS² /100 kW) of power. The power is transmitted to the wheels through a 6- speed manual gearbox. Its kerb weight³ is 1395 kg. The automobile is 4688mm long, its wheelbase is 2729mm. Carbon dioxide emissions are claimed to be 125.0 g/km.

Самостійна робота № 22

Theme Technical specifications of a car.

Task to do lexical exercises, to learn active vocabulary.

1. Choose a car system and use the Internet to gather information about it. Give a short presentation on your research or prepare a three-minute report on the car system you have chosen. Listen to feedback from others in your group. Here are some questions to investigate:

1. What is the function of a car system?
2. What are the components of the system? What are the functions of each component?
3. How does the system work?
4. What are the maintenance requirements of the system?

2. Work in pairs. Research to find information on the technical specifications of a car and complete the table. Exchange the information with your partner. Two questions are done for you.

- ✓ What is the body type of your car?
- ✓ How long is the car?

Specifications	Student A	Student B
Body		
Length, mm		
Wheelbase, mm		
Kerb weight, kg		
Engine type		
Engine capacity, l		
Cylinders		
Maximum power output, hp		
Engine coolant		
Maximum speed, km/h		
Fuel consumption, L/100 km		
Gearbox		
Carbon dioxide emissions, g/km		

Самостійна робота № 23

Theme Intelligent Transport Systems.

Task to read the text, to do lexical exercises, to learn active vocabulary.

1. Read the text about intelligent transport systems.

Intelligent Transport Systems (ITS) are vital to increase safety and tackle Europe's growing emission and congestion problems. They can make transport safer, more efficient and more sustainable by applying various information and communication technologies to all modes of passenger and freight transport.

Intelligent transport systems vary in technologies applied, from basic management systems such as car navigation; traffic signal control systems; automatic number plate recognition or speed cameras to more advanced applications that integrate live data and feedback from some other sources, such as parking guidance and information systems; weather information, etc.

In road transport, ITS have been developing for over 20 years. Some applications are now widespread. For example, several millions of cars and trucks are equipped with on-board navigation systems that can consider real-time traffic and travel information. Road accidents are a major cause of death in industrial countries. Numerous ITS can contribute to a possible solution. Inside the car or truck these include the advanced driver assistance systems. They support drivers to maintain a safe speed and distance, to drive within the lane, to avoid overtaking in critical situations and to safely pass intersections in an increasingly complex driving environment.

It is indisputable that a significant number of road accidents involving casualties occur in poor visibility, normally at night or in foggy conditions. Different types of sensors are used to obtain information about objects in the vicinity of the vehicle. The most frequently used technologies in the automotive industry are ultrasound sensors, infrared sensors, radars, LiDARs (Light Detection and Ranging).

2. Answer the following questions:

1. Why are Intelligent Transport Systems important in a transport sector?
2. How long have engineers been developing ITS in road transport?
3. What is the function of the advanced driver assistance systems?

4. What is the main reason of road accidents? 5. Which types of sensors are used in the automotive industry?

3. For nouns in column B find suitable attributes in column A.

A	B
1. Freight	camera
2. Speed	sensor
3. Infrared	traffic
4. Traffic	system
5. Real-time	transport
6. Assistance	signal

4. Complete the sentences with the phrases from the exercises 3.

- 1) A ___ is designed to catch speeding vehicles by taking a photograph.
- 2) Users of the transport corridor can now benefit from the mobility application Worldsensing developed which allows drivers to plan their journeys based on ___ information, request help or report accidents.
- 3) The ___ is generally located above a doorway and operates by continuously scanning the area and detecting the temperature contrast between a person and the surrounding environment.
- 4) A total of 300 delivery and transport vehicles have circulated in the city of Barcelona equipped with high-tech Advanced Driver ___ (ADAS) which is believed to be able to predict 80% of possible driver errors.
- 5) ___ is moving of goods from one place to another.
- 6) The world's first ___ was installed on Dec. 9, 1868, at the intersection of Bridge Street and Great George Street in London, near the Houses of Parliament and the Westminster Bridge.

Самостійна робота № 24

Theme Revision. Technical specifications of a car.

Task to do lexical exercises, to learn active vocabulary.

1. Match the words with their definitions.

driving licence, engine, cylinder, all-wheel drive, gas mileage, indicator, internal combustion engine, valve, vehicle, coolant, steering wheel, spark plug, wiper, carburettor

1. The wheel in a vehicle that the driver turns in order to make the vehicle go in a particular direction;
 2. Official permission for someone to drive a car, received after passing a driving test, or a document showing this;
 3. A machine, usually with wheels and an engine, used for transporting people or goods on land, especially on roads;
 4. A machine that uses the energy from fuel or steam to produce movement;
 5. A system in which a vehicle's engine supplies power to all its wheels instead of just to two, so that the vehicle can travel over very rough ground;
 6. An engine which generates power by the burning of fuel with air inside the engine to produce movement;
 7. The number of miles that a vehicle can travel using a particular amount of fuel;
 8. A long thin piece of metal with a rubber edge that moves across a windscreen to remove rain;
 9. A flashing light on a vehicle to show that it is about to change lanes or turn;
 10. A device in an engine that produces an electrical spark that lights the fuel and makes the engine start;
 11. A metal tube in the engine, in which a piston slides;
 12. A device that is used to mix air and petrol in the right proportions required for burning by the engine;
 13. A device that opens or closes to stop or allow gas or fluid flow;
 14. A liquid consisting of a mixture of water and antifreeze, used in the car's engine cooling system.
- ### 2. Complete the sentences using the words given below.

congested, high-performance, injured, gears, motor, production costs, comfortable, fuel, crowded, assembly line, automobiles, petrol, steering wheel, driver, electric, speed, engine, transmission, collision, hatchback, rear-view mirror, automatic transmission, brakes, traffic congestion, driving licence, traffic, vehicle

1. Both ... and diesel-powered cars need filling up with ... at the petrol station.
2. A car with an extra door at the back that can be lifted up to allow things to be put in is called
3. Some people were ... in the bus accident last week.
4. Henry Ford is known as the father of the modern which reduced for cars by reducing assembly time.
5. BMW has become synonymous with ... vehicles that are sophisticated in appearance and ... to drive.
6. In Minsk today the streets are ... with
7. If you turn the ..., the car will go right or left.
8. Hybrid electric vehicles use two power sources: a conventional ... and an electric ...
9. One of the first things you'll notice about driving an ... car is the lack of noise.
10. A ... enables the driver to see the vehicle or road behind.
11. A car using changes ... for you, giving you less work to do while driving.
12. The in the city gets worse during the summer.
13. Nowadays, a lot of new cars are equipped with an automatic emergency braking system that automatically activates the ... if the electronic system detects that the ... is likely to happen.
14. This engine is offered with a choice of five- ... manual or fourspeed automatic ...
15. ... roads and towns have too much ... and movement is made difficult.
16. You can't get a till you're eighteen in our country.
17. The police officer asked the ... whether he was the registered owner of the ...

Самостійна робота № 25

Theme Revision.

Task to do exercises, to learn new words.

Choose which word best fits each blank.

1. The logo for ... is easily recognizable. It consists of a black circle with the interior quartered and the sections within are blue and white.

- a) Mercedes
- b) Audi
- c) BMW

2. The first road vehicles were powered by

- a) steam
- b) electricity
- c) petrol

3. Buses, cars, ... are road vehicles as they have wheels and travel on roads.

- a) tram
- b) trucks
- c) ferry

4. ... transmissions require drivers to shift gears with a clutch pedal and shifter.

... cars tend to have four modes: Park, Reverse, Neutral, Drive.

- a) radio
- b) automatic
- c) manual

5. Most auto bodies are made of ..., but some are made of strong plastics or fiberglass.

- a) glass
- b) rubber
- c) steel

6. A ... is a car with a fixed roof, two doors, two or four seats, and usually a sloping back.

- a) sedan
- b) hatchback

c) coupe

7. A ... car is the best option if you aren't ready for an electric car as they are environmentally friendly and cheaper to run.

a) diesel

b) hybrid

c) petrol

8. You usually put on ... when you park your car so that it doesn't move by itself later (especially down hills). It is usually situated between the driver's seat and the passenger's seat.

a) clutch

b) hand brake

c) ignition

9. The up and down motion of the ... in the cylinder is converted into ... motion by the crankshaft.

a) valve

b) piston

c) rod a) linear b) longitudinal c) rotational

10. The rotational force generated by the engine is called

a) torque

b) valve

c) transmission

11. The alternator provides ... to every part of the vehicle once it is started.

a) air

b) fuel

c) power

Самостійна робота № 26

Theme Cruise Control.

Task to read the text, to learn active vocabulary.

Cruise Control.

Cruise control is the ideal example of a closed loop control system. The purpose of cruise control is to allow the driver to set the vehicle speed and let the system maintain it automatically. The system reacts to the measured speed of the vehicle and adjusts the throttle accordingly. The reaction time is important so that the vehicle's speed does not feel as if it is surging up and down. Other facilities are included such as allowing the speed to be gradually increased or decreased at the touch of a button.

Cruise control components

Actuator	A number of methods are used to control the throttle position. Vehicles fitted with drive by wire systems allow the cruise control to operate the same actuator. A motor can be used to control the throttle cable or in many cases a vacuum-operated diaphragm is used which three simple valves control
Main switch and warning lamp	This is a simple on/off switch located in easy reach of the driver on the dashboard. The warning lamp can be part of this switch or part of the main instrument display as long as it is in the driver's field of vision
Set and resume switches	These are fitted either on the steering wheel or on a stalk from the steering column. When they are part of the steering wheel slip rings are needed to transfer the connection. The 'set' button programmes the speed into memory and can also be used to increase the vehicle and memory speed. The 'resume' button allows the vehicle to reach its last set speed or to temporarily deactivate the control
Brake switch	This switch is very important as it would be dangerous braking if the cruise control system was trying to maintain

	the vehicle speed. This switch is normally of superior quality and is fitted in place or as a supplement to the brake light switch activated by the brake pedal. Adjustment of this switch is important
Clutch or automatic gearbox switch	The clutch switch is fitted in a similar manner to the brake switch. It deactivates the cruise system to prevent the engine speed increasing if the clutch is pressed. The automatic gearbox switch will only allow the cruise to be engaged when it is in the 'drive' position. This is again to prevent the engine overspeeding if the cruise tried to accelerate to a high road speed with the gear selector in '1' or '2' position. The gearbox will still change gear if accelerating back up to a set speed as long as it 'knows' top gear is available
Speed sensor	This will often be the same sensor that is used for the speedometer. If not, several types are available; the most common produces a pulsed signal, the frequency of which is proportional to the vehicle speed
Headway sensor	Only used on 'active' systems, this device uses radar or light to sense the distance from the vehicle in front

Самостійна робота № 27

Theme Security System.

Task to read the text, to learn active vocabulary.

Security System

Car and alarm manufacturers are constantly fighting to improve security. Building the alarm system as an integral part of the vehicle electronics has made significant improvements. Even so, retrofit systems can still be very effective. Three main types of intruder alarm are used:

- switch operated on all entry points;
- battery voltage sensed;
- volumetric sensing.

There are three main ways to disable the vehicle:

- ignition circuit cut off;
- starter circuit cut off; ●
engine ECU code lock.

Most alarm systems are made for 12 V, negative earth vehicles. They have electronic sirens and give an audible signal when arming and disarming. They are all triggered when the car door opens and will automatically reset after a period of time, often one or two minutes. The alarms are triggered instantly when entry point is breached. Most systems are two pieces, with separate control unit and siren; most will have the control unit in the passenger compartment and the siren under the bonnet. Most systems now come with remote 'keys' that use small button-type batteries and may have an LED that shows when the signal is being sent. They operate with one vehicle only. Intrusion sensors such as car movement and volumetric sensing can be adjusted for sensitivity. When operating with flashing lights, most systems draw approximately 5 A. Without flashing lights (siren only), the current drawn is less than 1 A. The sirens produce a sound level of approximately 95 dB, when measured 2 m in front of the vehicle. The system, as is usual, can be considered as a series of inputs and

outputs. This is particularly useful for diagnosing faults. Most factory-fitted alarms are combined with the central door locking system. This allows the facility mentioned in a previous section known as lazy lock. Pressing the button on the remote unit, as well as setting the alarm, closes the windows and sunroof and locks the doors. A security code in the engine ECU is a powerful deterrent. This can only be ‘unlocked’ to allow the engine to start when it receives a coded signal. Ford and other manufacturers use a special ignition key which is programmed with the required information. Even the correct ‘cut’ key will not start the engine. Of course, nothing will stop the car being lifted onto a truck and driven away, but this technique will mean a new engine control ECU will be needed.

Самостійна робота № 28

Theme Hybrid Cars.

Task to read the text, to learn active vocabulary.

Hybrids

Hybrid cars are becoming more popular and more common. Basically, a hybrid car is one that uses two or more engines, i.e., an electric motor and a conventional engine (either petrol or diesel). The electric engine powers the car at lower speeds, and the gas engine powers it at higher speeds. A hybrid car like the Toyota Prius or Honda Civic Hybrid not only conserves fuel but also produces less CO₂ emissions.

Though hybrid vehicles are now growing in popularity still few people are actually using them, mainly due to a lack of knowledge of how hybrid vehicles work and whether they're as good as other gasoline-powered vehicles.

While the technology has existed since the early 1900's, it has only been in the past decade or so that the price of manufacturing them has brought them into the range of possibility for the average driver. There are also more government incentive programs that use credits and special discounts to support the purchase and use of hybrid vehicles. Many cities are switching their public transportation and service vehicles over to hybrid cars and buses as a part of their program to become more environmentally responsible.

Wikipedia defines hybrid vehicle as,

“A hybrid vehicle uses two or more distinct types of power, such as internal combustion engine+electric motor, e.g. in diesel-electric trains using diesel engines and electricity from overhead lines, and submarines that use diesels when surfaced and batteries when submerged. Other means to store energy include pressurized fluid, in hydraulic hybrids.”

How Hybrid-Electric Vehicles Work?

Hybrid-Electric Vehicles (HEVs) combine the advantages of both the internal combustion engine, or gasoline engines, and electric motors that use energy stored

in batteries. The key areas of performance are regenerative braking, dual power sources, and less idling.

Hybrid electric cars work by charging the battery through regenerative braking and by the internal combustion engine, and not by directly plugging in the vehicle to charge the batteries.

Through the electric motor and the battery, extra power is being provided, which allows the use of a smaller engine and even provides auxiliary loads which could reduce the idling of the engine. In total, these features result in better fuel economy while maintaining great vehicle performance.

Hybrid electric cars work through the use of different key components, and some of them are: The auxiliary battery, which provides electricity to start the car before engaging the traction battery;

The DC/DC converter, which converts the higher-voltage DC power from the traction battery to the lower-voltage DC power to run the vehicle accessories and recharge the auxiliary battery;

The electric generator, which provides electricity from the rotation of the wheels while braking, transferring the energy back to the traction battery; The electric traction motor, which uses power from the traction battery to drive the wheels;

The exhaust system which is designed with a three-way catalyst to reduce emissions from the engine out through the tailpipe; The spark-ignited internal combustion engine which allows air to combine with fuel and ignite by the spark from a spark plug;

And the power electronics controller, which manages the flow of electric energy from the traction battery, allowing the control of the speed of the traction motor and the torque being produced.

Regenerate braking

A hybrid electric vehicle cannot be plugged in for the battery to charge. The battery is charged with the help of regenerative braking and by the internal combustion engine. It helps to transform kinetic energy produced by the moving car into electrical energy stored back in the batteries.

The electric motor powers the vehicle as well as resists its motion. When you apply the brakes to slow down, this resistance slows down the wheel and simultaneously recharges the batteries.

Dual power

Depending on driving circumstances, power can come from either the engine, the motor or both. The electric motor is in use at low speeds. When you pick up the speed, your combustion engine kicks in. Afterward, the electric battery recharges itself using the combustion engine. The electric motor also provides additional power to assist the engine in accelerating or climbing.

For mild hybrids, they use both a battery and an electric motor to provide power for the vehicle and also allow the engine of the vehicle to shut off when it is not in motion. Mild hybrids are dependent on both electricity and fuel, but they cost less than full hybrid cars.

On the other hand, full hybrid cars use larger batteries and much more powerful electric motors, which help in providing power for the vehicle to travel short distances

and at low speeds, only with the help of electricity. They cost more than mild hybrid cars, but they provide better fuel economy as they have a larger battery capacities and more powerful motors.

Automatic start/shutoff

When the vehicle comes to a stop, it automatically shuts off the engine and restarts it when the accelerator is pressed down. This automation is much simpler with an electric motor.

The additional power provided by the electric motor can potentially allow for a smaller engine. The battery not only powers auxiliary loads, but it also reduces engine idling when it stops. These features altogether result in better fuel economy without hampering performance.

While most people associate hybrid vehicles with the kinds that use electricity as their primary alternate fuel, there are more options available now. There are cars that use hybrid technologies with propane and natural gas as well.

A hybrid car is best defined as a vehicle that has an engine that can switch between fossil fuel and an alternate fuel source. On the other hand, there are electric cars that use rechargeable batteries and have their advantages and disadvantages.

Advantages of a Hybrid Car

Here are a few of the top advantages of having a hybrid car:-

1. Environmentally Friendly

One of the biggest advantages of a hybrid car over a gasoline-powered car is that it runs cleaner and has better gas mileage, which makes it environmentally friendly. A hybrid vehicle runs on a twin-powered engine (gasoline engine and electric motor) that cuts fuel consumption and conserves energy.

2. Financial Benefits

Hybrid cars are supported by many credits and incentives that help to make them affordable. Lower annual tax bills and exemption from congestion charges come in the form of a smaller amount of money spent on fuel.

3. Less Dependence on Fossil Fuels

A Hybrid car is much cleaner and requires less fuel to run, which means fewer emissions and less dependence on fossil fuels. This, in turn, also helps to reduce the price of gasoline in the domestic market.

4. Regenerative Braking System

Each time you apply the brake while driving a hybrid vehicle, it helps you recharge your battery a little. An internal mechanism kicks in that captures the energy released and uses it to charge the battery, which in turn eliminates the amount of time and need for stopping to recharge the battery periodically.

5. Built From Light Materials

Hybrid vehicles are made up of lighter materials, which means less energy is required to run them. The engine is also smaller and lighter, which also saves much energy.

6. Assistance From Electric Motor

The electric motor assists the internal combustion engine in case of accelerating, passing or climbing a hill.

7. Smaller Engines

The gasoline engines used in hybrid cars are usually small, light, and highly efficient as they don't have to power the car alone.

8. Automatic Start and Stop

In hybrid cars, the engine is automatically shut off when the vehicle is idle and starts when the accelerator is pressed. In comparison to traditional hybrid vehicles, PHEVs can drive longer distances at higher speeds. Hydrogen fuel cell vehicles have lower energy emissions because they emit only water vapor and warm air.

9. Electric-Only Drive

Hybrid vehicles can be driven entirely on electricity. This usually happens while moving at low speeds, when the engine is idling at a stoplight or when the engine starts up. Normally, the internal combustion engine starts operating only at higher speeds, where it has more efficiency. This helps increase the overall fuel efficiency of the vehicle.

10. Higher Resale Value

With a continuous increase in the price of gasoline, more and more people are turning towards hybrid cars. The result is that these green vehicles have started commanding higher than average resale values. So, in case you are not satisfied with your vehicle, you can always sell it at a premium price to buyers looking for it.

There are many advantages to owning a hybrid car. The one thing you will like the best is how it helps control your budget as gas prices continue to get higher. The other benefit that is not seen directly is how owning and driving a hybrid car impacts the environment. It reduces your dependence on fossil fuels and lowers your carbon imprint on the environment.

Disadvantages of a Hybrid Car

There are disadvantages to owning a hybrid car, but they are probably not what you think. Contrary to the popular myth, hybrid cars have just as much power as regular cars and have no issues with mountain driving or towing. The disadvantages will depend on the type of hybrid fuel that your vehicle uses.

Here are a few of the disadvantages of a hybrid car:-

1. Less Power

Hybrid cars have twin-powered engines. The gasoline engine, which is the primary source of power, is much smaller as compared to what you get in single-engine powered cars, while the electric motor is of low power. The combined power of both is often less than that of a gas-powered engine. It is therefore suited for city driving and not for speed and acceleration.

2. Can be Expensive

The biggest drawback of having a hybrid car is that it can burn a hole in your pocket. Hybrid cars are comparatively more expensive than regular petrol cars and can cost \$5000 to \$10000 more than a standard version. However, that extra amount can be offset with lower running costs and tax exemptions.

3. Poorer Handling

A hybrid car houses a gasoline-powered engine, a lighter electric engine, and a pack of powerful batteries. This adds weight and eats up the extra space in the car. Extra

weight results in fuel inefficiency and manufacturers cut down weight, which has resulted in motor and battery downsizing and less support in the suspension and body.

4. Higher Maintenance Costs

The presence of a dual engine and continuous improvement in technology make it difficult for mechanics to repair the car, and the cost of maintenance is also much higher. It is also difficult to find a mechanic with such expertise.

5. Accident from High Voltage in Batteries

In the event of an accident, the high voltage present inside the batteries can prove lethal for you. There is a high chance of you getting electrocuted in such cases, which can also make the task difficult for rescuers to get other passengers and the driver out of the car.

6. Battery Replacement is Pricey

According to Green Car Reports, battery replacement in hybrid vehicles is currently rare. However, if a battery needs to be replaced, it can get pricey.

7. Battery Disposal and Recycling

The batteries that are at the end of their useful life cycle can be recycled to harvest usable materials for repurposing. This removes waste from the environment. However, the main issue with recycling lies in the collection rate of vehicle batteries.

The same problem lies in recycling lithium batteries in mobile electronics. Although lithium is 100% recyclable, extracting it costs too much to make it of high economic value. It is only done because of federal mandates and/or ecological purposes.

8. Hydrogen Fuel Cell Issues

The source of hydrogen can be both “clean” sources such as solar or wind power or “dirty” sources like coal and natural gas. Sourcing from coal and natural gas undermines the ecological motive for the use of hydrogen fuel cell vehicles.

Production of hydrogen is also expensive, and the fuel cells require refueling at a hydrogen station. At present, these stations are only located in California and near Toronto.

Making Your Decision

Deciding whether or not a hybrid car is right for you involves more than just a desire to be environmentally friendly. You have to look at the resources in your area that can help you maintain and sustain the car.

VOCABULARY

A

accessories обладнання

adjust налаштовувати, регулювати

affect 1) впливати, діяти; 2) порушувати, пошкодити

affordable прийнятний, можливий

Anti-lock braking system (ABS) антиблокувальна система гальм

appearance зовнішній вигляд

assembly line збірний конвеєр

attach прикріплювати

audible чутний, звуковий

Autonomous emergency braking system автономна система аварійного гальмування

B

brake гальмівний механізм, гальмувати

to apply / step on a brake – натиснути на гальма

to release a brake – відпустити гальма

belt ремінь, пасок

safety belt (seat belt) – ремінь безпеки

timing belt – ремінь приводу газорозподільчого механізму

boast вихвалитися

boot багажник

bonnet капот

bulky об'ємний, великий

C

camshaft розподільний вал, кулачковий вал
capacity потужність; 3) робочий об'єм двигуна
carpool об'єднання власників лекових автомобілів для спільного користування
carriage екіпаж; карета; повозка; платформа; транспорт; перевезення
charge 1) заряд (електричний); 2) заряджати; 3) витрати
chassis ходова частина; шасі
clearance 1) зазор 2) кліренс;
collision зіткнення
comfortable зручний
congest перегружати
congestion скупчення (транспортних засобів); затор (руху); дорожня пробка
connecting rod шатун
consume споживати; витрачати (напр. паливо)
consumption споживання
fuel consumption – споживання палива
convenience зручність
convenient зручний
coolant охолоджуюча рідина; охолоджувач; хладагент
crack тріщина, тріщати
crankshaft колінчатий вал; колінвал
crash аварія, сильний удар при зіткненні
current 1) електричний ток; 2) потік; 3) поточний
D
damage 1) пошкодження, пошкоджувати 2) дефект
dent вм'ятина, пролом
deploy розгортати, спрацьовувати (подушки безпеки)
distinguish відрізняти
doorlock дверний замок
downside недодік
drawback недолік
E
Electronic stability control електронний контроль стабілізації, система курсової стійкості
emit виділяти
emissions викид забруднюючої речовини в атмосферу
engine двигун
internal combustion engine – двигун внутрішнього згорання
enhance збільшувати, покращувати, посилювати
environmentally friendly екологічний, такий, який не забруднює навколишнє середовище
excessively надмірно

exhaust 1) випуск; 2) вихлоп

exhaust pipe вихлопна труба

expel видаляти

F

fatigue втомленість

feature характерна риса; 1) (технічна) характеристика; 2) особливість; відмінна риса

fender крило

fiberglass скловолокно

flashlight кишеньковий ліхтар

flexibility гнучкість, м'якість ходу автомобіля, маневреність

fluid рідина

fog туман

front передній

fuel 1) паливо; 2) заправляти паливом

fuel tank – паливний бак

G

gap 1) інтервал

gasoline амер; брит. **petrol** – бензин

gas station = *gasoline station* – автозаправна станція

gas guzzler – пожирач палива

gear 1) зубчата передача; шестерня; 2) механізм; привід;

gearbox коробка передач; коробка швидкостей

gearshift (*gearlever*) ричаг перемикання передач

guide направляти

H

handling 1) керування; 2) догляд (за механізмом)

hatch люк, задні двері з фрамугою

hazard ризик; небезпека, загроза

headlight фара

hood капот

I

incredible неймовірний

indicator 1) індикатор; показник; 2) вимірювальний пристрій зі шкалою;

injure ранити; завдавати шкоди;

injury 1) пошкодження; 2) травма

impurity забруднення; домішки

interior 1) внутрішній; 2) інтер'єр

irritation незадоволення, роздратованість

insulation 1) ізоляція; 2) ізоляційний матеріал

intervene втручатися

J

jack домкрат

jumble плутанина

jumper cables = **jump leads** – електропровода великого перерізу (для запуску двигуна від сороннього джерела)

L

lane смуга руху

lateral поперечний, боковий

leakage витік; протікання; підтікання

lifter підйомник (напр. автомобільний)

liquid 1) рідина; 2) рідкий

logo (logotype) логотип, фірмовий знак, емблема

lug wrench ключ для гайок кріплення колеса

luggage багаж

M

maintenance технічне обслуговування, догляд, поточний ремонт, експлуатація

mid-size car сімейний/середньогабаритний автомобіль

mileage пробіг автомобіля в милях

mixture суміш

fuel-air mixture – паливна суміш

moisture волога; вогкість

N

navigate керувати, направляти

number plate номерний знак

O

obsess about / over постійно думати чи говорити про щось

obstacle перешкода

obvious очевидний

offer пропонувати

P

parking lot автостоянка; парковка

piston поршень;

piston rod – шток поршня; шатун

piston ring – кільце поршня

performance 1) характеристика (роботи двигуна); 2) експлуатаційні якості,

plug in вмикати в мережу, вставляти вилку в розетку

pollute забруднювати (повітря, воду, навколишнє середовище);

to pollute the environment – забруднювати навколишнє середовище

pollution забруднення (навколишнього середовища)

pretensioner натягувач ременя безпеки

“a pretty penny” кругленька сума грошей

previous попередній

preventive repair профілактичний ремонт

preventive inspection профілактичний огляд

preventive maintenance профілактичне обслуговування

purchase покупка; купувати

push штовхати, натискати

R

range 1) діапазон; 2) запас ходу; пробіг без підзаправки

reliable безвідмовний, надійний в роботі (про механізм, обладнання)

rear window заднє вікно

rebound відскакувати, пружинити

recycle переробляти

reduce зменшувати

release звільняти, випускати

reverse 1) зміна напрямку; 2) задній хід; зворотній хід

roar ревіти, гриміти

roof дах

rope трос, канат

rubber edge гумовий край

rust іржа, іржавіти

S

sag прогиб; прогибатися

scratch подряпина, дряпати

seal 1) плomba, пломбувати; 2) уплотняти

to seal in – герметизувати

shell кожух; корпус

body shell – корпус кузова

side mirror бокове дзеркало заднього виду

signify мати значення, виражати

skidding занос

slanted під нахилом

sleek глянце́вий, доглянутий

smooth гладкий; плавний; вирівнювати

spare запасна деталь

spin обертати, обертання

spacious просторий, великий

steam 1) пара; 2) випаровуватися

steer 1) кермо; 2) кермувати; вести;

steering рульове керування, керування напрямком руху

steering system – система рульового керування
steering wheel рульове колесо
stiff жорсткий, міцний
stroke такт; ход
intake stroke – такт впуску
compression stroke – такт стиснення
combustion stroke = power stroke = ignition stroke – такт згорання
exhaust stroke – такт вихлопу
substance речовина, матеріал
sump піддон
supply постачання, постачати, доставляти
support підтримка, основа, опора
suspension підвіска
suitable відповідний
swerve відхилення від курсу, поворот

T

tag ярлик, етикетка
tear зношення, розрив
timid боязкий, сором'язливий
tinted пофарбований
transmit 1) відправляти; 2) передавати; 3) проводити
torque крутний момент
tow буксирувати, тягнути автомобіль
traffic jam затор; дорожня пробка
transmission 1) коробка передач; 2) передача; привід; трансмісія
trim внутрішня оббивка; оббивка салону (автомобіля)
truck вантажний автомобіль, грузовик
trunk багажник

U

underneath внизу, вниз
uneven нерівний, нерівномірний, нестійкий
unveil оголошувати, повідомляти

V

valve клапан; вентиль;
inlet valve – впускний клапан
exhaust valve – випускний клапан
van автомобіль-фургон, кузовфургон
vapor пара, випаровуватися
vehicle транспортний засіб; автомобіль
volatile летючий

W

warranty гарантія

wheel well відсік для шасі

windscreen (windshield) ветровое скло; переднє скло

wiper склоочисник, двірник (вітрового скла)

wear зношення

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