

МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
НАЦІОНАЛЬНИЙ ТЕХНІЧНИЙ УНІВЕРСИТЕТ
«ХАРКІВСЬКИЙ ПОЛІТЕХНІЧНИЙ ІНСТИТУТ»

ПОШУК ТА ОБРОБКА ІНФОРМАЦІЇ

**Методичні вказівки з англійської мови для студентів 1 курсу
спеціальності Автомобільний транспорт**

INFORMATION SEARCHING AND PROCESSING

**English learner guide for 1st year students
specialty Automobile Transport**

Затверджено
редакційно-видавничою
радою університету,
протокол № 3 від 12.10.23 р.

Харків
НТУ «ХПІ»
2023

Пошук та обробка інформації: Методичні вказівки з англійської мови для студентів 1 курсу спеціальності Автомобільний транспорт = Information searching and processing: English learner guide for 1st year students / уклад. О. Є. Коржавіна, Ю. Ю. Іванова. Харків: НТУ «ХП», 2023. с.

Укладачі: Коржавіна О.Є., Іванова Ю. Ю.

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Unit 1

1.1. Means of Transport

Word list

rural – сільський, сільськогосподарський

facility – засіб, обладнання

supply – забезпечення, харчування

capacity - можливість, ємність

tremendously – надзвичайно

labourer – працівник

essential – важливий

to set up – створити, заснувати

cargo – вантаж

fleet – флот, авіапарк

no-frills – без надмірностей

Task 1. Read the three texts about different means of transport and their economic importance. Complete the sentences using the verb in brackets in the right form of the passive.

Text 1 The Donkey



In today's modern world of articulated lorries, high-speed railways and super-efficient courier services, it is easy to forget that many rural communities and villages across the world would disappear if there were no donkeys. Much of the world is dependent on

donkeys moving food from farms to small towns. Donkeys generally work very hard in rural and mountainous areas where there aren't any modern transport facilities. They carry huge amounts of food from the villages to the towns and bring supplies back to the village. If a lorry runs out of diesel or petrol, it cannot (1) ____ (use), but the donkey just needs grass, water and rest and is ready to work again for long hours.

Text 2 The Railways



Many countries have an effective network of railways to help transport different types of goods. The earliest recorded system was in Ancient Greece in 600BC. Since then, rail-links (2) ____ (build) to connect short distances. In the 19th century, this changed dramatically. Many countries developed their own network with private links between different towns with Germany and Britain leading the way. These links provided the capacity to carry heavy

goods such as coal, iron ore and wood. Building a railway was tremendously hard work for labourers. Railways are extremely expensive to construct but essential for transporting raw materials and finished goods such as textiles quickly and cheaply. In the early 19th century, the first passengers travelled on the railways with horse-drawn carriages. From 1840 -1850, Britain (3) ____ completely ____ (connect) by railways and used steam engines to pull carriages.

Text 3 Air Travel



Air-travel is the most modern form of public transport and it (4) ____ (develop) in the 20th century. Millions of people use airplanes for a variety of reasons. It is also extremely expensive to set up air-travel facilities. Some travel for business, others go on holiday by air and others use cargo planes to move their products from country to country

very quickly. Some courier companies now have their own fleet of planes ready to carry parcels and post more efficiently. There are different types of passenger services – some are cheap and provide a ‘no-frills’ service which is good for short journeys. Other airlines provide passengers with a luxurious flying experience. Airports are getting busier and it is evident that more passengers and businesses than ever are using airplanes to get to their destinations

Task 2. Read the statements below and then decide if they are True (T) or False (F)

Statement	Answer
1. The Ancient Greeks had a railway system in 800BC.	
2. The very early railways connected a lot of cities.	
3. British passengers first travelled on trains in the 1820s.	
4. ‘No-frills’ airlines are popular because they are costly.	
5. Some courier services use their own convoys of planes.	

Task 3. Match the phrases from Texts 1, 2 and 3 in Column A to the nearest meaning in Column B

Column A	Column B
1. Courier	a) Safe roads and rail-tracks
2. Modern transport facilities	b) Collection of aircrafts
3. Unperishable goods	c) Hard labour
4. Tremendously hard work services	d) Simple, no extras
5. Fleet of planes	f) Non-consumable items
6. No-frills	g) Parcel delivery service

Task 4. Join the first half of the sentence in Column A to the correct ending in Column B

Column A	Column B
1. Many remote communities need mules	A to transport non-food goods.
2. British railway networks developed	B but are needed by industry and governments for quick transport.
3. Many countries have an effective	C because they can deliver a more

network of railways	efficient service.
4. Railways are extremely expensive to construct	D because more passengers and businesses are using air transport.
5. Some courier companies now have their own fleet of planes	E to transport food, raw materials and essentials.
6. Airports are getting busier	F extremely quickly during the mid 19th century.

Task 5. Now complete the notes below with a suitable word or phrase from the texts. You can use up to 3 words.

Many communities would disappear if there were no donkeys.

Donkeys are a _____ (2) which can travel in the countryside and mountain regions.

They take goods to sell and bring back _____ (3) to the villages.

Railways are _____ (4) for carrying _____ (5) materials and finished _____ (6).

They are used to carry _____ (7) items.

They are _____ (8) expensive to construct.

Airplanes are used for a _____ (9) of reasons.

Many courier companies have their own _____ (10) of planes to transport letters and parcels more quickly.

Task 6. In your own words (100-130 words), write a summary of the three texts about Means of Transport.

Plan:

Introduction:

- Different types of transport
- Economic importance

Main part:

1. Donkeys – rural /mountainous areas
 - Advantages – keep working; easy to look after

2. Railways – started in Ancient Greece 600BC

- First covered short distances – privately built – carried heavy raw materials and finished goods
- Expensive but essential for economy
- Early 19th century – carried first passengers in horse-drawn carriages
- 1840s – Britain completely connected by railways using steam engines.

3. Airplanes – most modern form of transport – developed in 20th century

- Many different uses – passenger / courier
- Varying prices and types of service

Conclusion:

Different types of transport – variety of purposes and all important to the economy.

1.2 Introduction. Invention of wheel

Word List

vehicle - транспортний засіб

wheel – колесо

references – посилання

longitudinal boards - поздовжні дошки

descendants - нащадки

spoked wheel - колесо зі спицями

in conjunction – у сполученні

friction – тертя

tire – шина

technological advancement – технологічний прогрес

cogwheel – шестерна

spinning wheel – обертове колесо

mankind – людство

Task 1. Read the text and find the following information:

- **the age of wheel's invention**
- **the origin of the word "car"**

Introduction

You must have heard the word automobile. The meaning of automobile can be an auto car, motor car or car. It is a wheeled motor vehicle used for transporting goods or passengers, which also carries its own engine or motor.

The word automobile comes from the ancient Greek word αὐτός (autós, meaning 'self') and the Latin word mobilis (movable), therefore automobile means a vehicle that moves itself. The alternative name, 'car' is believed to have originated from the Latin word carrus or carrum (wheeled vehicle), or the Middle English word carre (cart) (from Old North French). These words in turn are said to have originated from the Gaulish word karros (a Gallic chariot).

Most definitions of the term specify that automobiles are designed run primarily on roads, have seating for one or more people, typically have four wheels and are constructed principally for the transport of people and goods.

Invention of wheel

The wheel is considered as one of the most important mechanical inventions of all times. The wheel has been used by man since the beginning of civilisation. Most primitive technologies since the invention of the wheel have been based on its principles. The invention of the wheel perhaps happened in the late Neolithic age. It is likely that along with other technological advancements, it gave rise to the early Bronze Age.

Since the Industrial Revolution, the wheel has been a basic element of nearly every machine constructed by mankind. While the exact time and place of the invention of the wheel has been disputed, its beginnings can be seen across ancient civilisations.

History tells us that wheel was most likely invented in Mesopotamia (modern day Iraq) around 3500 BC. This means that the wheel is about 5500 years old!

The first use of the wheel for transportation was in Mesopotamian chariots in 3200 BC. There are many references to wheeled chariots in Indian mythology also, dating to around 3000 BC. It is interesting to note that wheels may have been used in industrial or manufacturing applications before they were used on vehicles. Egyptians started using wheel with spokes, first in chariots around 2000 BC and use of wheels is believed to have started in Europe by 1400 BC.

Wheel and Its Structure

It is hard to imagine any mechanised system that would be possible without a wheel or a idea of a symmetrical component moving in a circular motion about an axis. From tiny watch gears to automobiles, jet engines and computer disk drives, the principle is the same. Early wheels were simple wooden disks with a hole for the axle. Due to the structure of wood, a horizontal slice of a tree trunk is not suitable, as it does not have the structural strength to support weight without collapsing; rounded pieces of longitudinal boards are required. The oldest known example of a wooden wheel and its axle was found in 2003 in the Ljubljana Marshes some 20 km south of Ljubljana, the capital of Slovenia.

The earliest known examples of wooden spoked wheels are in the context of the Andronovo culture, dating to circa 2000 BC. Soon after this, horse cultures of the Caucasus region used horse-drawn spoked-wheel war chariots for the greater part of three centuries. They moved deep into the Greek Peninsula where they joined the existing Mediterranean people to give rise, eventually, to classical Greece after the breaking of Minoan dominance and consolidations led by pre-classical Sparta and Athens. Celtic-chariots introduced an iron rim around the wheel in the first millennium BC. The spoked wheel was in continued use without major modification until the 1870s, when wire wheels and pneumatic tires were invented. The invention of the wheel has also been important for application in the water wheel, the cogwheel, the spinning wheel and the astrolabe. More modern descendants of the wheel include the propeller, the jet engine, the flywheel (gyroscope) and the turbine. Therefore, we see that a wheel is a circular component (Fig.1.3) that can rotate on its centre. Wheels, in conjunction with axles, allow moving heavy objects with ease. The wheel is the main component of the wheel and axle assembly. Wheel and axle were used in the first carriages. A wheel greatly reduces friction by facilitating motion by rolling together with the use of axles. In order for wheels to rotate, a push is needed to rotate the wheel about its axis.

The wheel is a device that enables efficient movement of an object across a surface where there is a force pressing the object to the surface. Common examples are a cart pulled by a horse and the rollers on an aircraft flap mechanism.

The low resistance to motion is explained as follows:

- The normal force at the sliding interface is the same.
- The sliding distance is reduced for a given distance of travel.
- The coefficient of friction at the interface is usually lower.

The classic spoked wheel with hub and iron rim was in use from about 500 ACE (Iron Age Europe) until the twentieth century AD.



Fig. 1.3: Wheel — a circular component

Task 2. Complete the sentences.

- a) Since the Industrial Revolution, the wheel has been a basic element...
- b) Early wheels were...
- c) The spoked wheel allowed...
- d) The invention of the wheel has also been important for application in...
- e) The wheel is a device that enables...

Task 3. Complete the notes below with a suitable word or phrase from the texts. You can use up to 3 words.

1. _____ is considered as one of the most important mechanical inventions of all times.
2. Wheel was invented in _____ in around 3500 BC that is _____ years ago.
3. A wheel is a _____ component that can rotate on its centre.
4. Wheel is a _____ that enables efficient movement of an _____ across a surface where there is a force pressing it to the surface.
5. The coefficient of friction at the interface of wheel is usually _____.

Task 4. Choose the correct letter a, b, c or d.

How many years ago was the wheel invented?

- a) 2500 years
 - b) 3500 years
 - c) 5000 years
 - d) 6000 years
2. Spoked wheel is used for which category of vehicle?
- a) Light
 - b) Medium
 - c) Heavy
 - d) None of the above
3. Axle of wheel is fitted in the wheel in the _____.
- a) top
 - b) bottom
 - c) centre
 - d) side

Task 5. Read the statements below and then decide if they are True (T) or False (F)

Statement	Answer
1) Automobiles are constructed principally for the transport of people and goods.	
2) The wheel has been used by man since 2000 BC.	
3) The wheel is about 550 years old.	

4) Early wheels were simple were simple spoked wheels.	
5) Modern descendants of the wheel include the propeller, the jet engine, the flywheel (gyroscope) and the turbine.	
6) Wire wheels and pneumatic tires were invented in the 1870s.	

Task 6. Find in the text English equivalents of the following:

4. Етапи розвитку	A. vehicle
5. Колесо	B. spoked wheel
6. Технологічний прогрес	C. axis/axle
7. Винахід	D. tire
8. Людство	E. cogwheel
9. Візок, колісниця	F. friction
10. Транспортний засіб	G. spinning wheel
11. Вісь	H. technological advancement
12. Колесо зі спицями	I. mankind
13. Шина	J. wheel
14. Шестерна	K. invention
15. Тертя	L. stages of development
16. Обертове колесо	M. chariot

Task 7. Transform Active Voice sentences into Passive Voice sentences:

Example:

ACTIVE High oil prices impact even Cina in 2011.

PASSIVE Even China was impacted by high oil prices in 2011.

- 1) In 2011 China alone contributed to 80% of the world growth of electricity consumption.
- 2) A sensory screen enables the control of the eReader functioning.
- 3) Immediately after the accident at the Fukushima plant the management implemented measures to stabilize situation.
- 4) The increase of the coal share for electricity production caused the growth of CO2 emissions in the G20 countries.
- 5) Enerdata, an independent Research & Consulting firm, carried out this analysis.
- 6) The Tolino Shine eBook reader provides a size of letters tuning.

- 7) In 2011 high oil prices resulted in a decrease of oil demand in European countries, the USA and Japan.

Unit 2

MAJOR SYSTEMS & COMPONENTS OF AN AUTOMOBILE

2.1 Automobile Work

Word list:

to lubricate – змащувати

clutch – зчеплення

gearbox – коробка передач

axle – ось

steering gear – рульовий механізм

suspension – підвіска

jolt – удар

flywheel – махове колесо

crankshaft – колінчастий вал

springing – ресори

charging rate – швидкість заряду акумулятора

ignition system – система запалювання

bearing surfaces – тертьові поверхні

framework – каркас

windscreen wipers – склоочисник

spark plug – свіча запалювання

linkage – з'єднання

propeller/cardan shaft - карданна передача

shock absorber – амортизатор

rear lights – задні фари

friction linings – фрикційні накладки

lever – важіль

Task 1. Read the text “Automobile Work” and say what systems are necessary for a good performance of a car.



An automobile is composed of many different working units and parts. To provide the energy to make it move a car has an **engine** which in turn needs electric current, petrol and air. The engine also needs cooling so it does not become too hot and oil to lubricate the bearing surfaces. There is the **transmission system** of a clutch, gearbox, propeller (cardan) shaft and axles which transmits power from the engine to wheels to move the car along the road. The **steering** mechanism is needed to guide the car in the right direction, brakes – to slow it down and stop it, and **suspensions** – to smooth out most of bumps and jolts.

Automobiles are vehicles for land transportation of people or goods or for moving materials. The automobile consists of the following components: a)

the engine; b) the framework; c) the mechanism that transmits the power-engine to the wheels; d) the body.

An automobile, powered by a petrol engine, begins to operate when the driver turns a **flywheel** connected to the engine **crankshaft**. As the crankshaft revolves, a mixture of fuel and air is drawn from a carburetor into the engine cylinders. The **ignition system** provides the electric sparks that ignite this mixture. The resultant explosions of the mixture turn the crankshaft, and the engine starts moving.

Cooling, electrical, ignition and lubrication systems are of great importance for the good performance of a car. The lights, radio and heater add to the comfort and convenience of the car. The indicating devices keep the driver informed as to the engine temperature, oil pressure, amount of fuel, and battery charging rate.

Brakes are of drum and disk types. The steering system consists of a manually operated steering wheel, which is connected by a steering column to the steering gear from which linkages run to the front wheels.

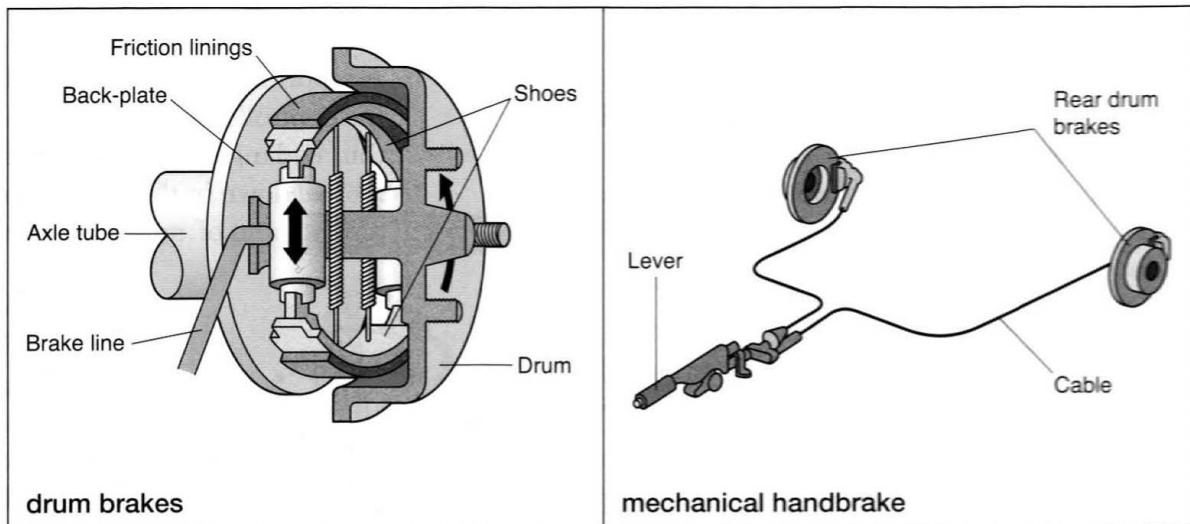
Task 2. Scan the text and answer the following questions:

- What components does the automobile consist of?
- What do the indicating devices do?
- What can you say about the steering system?

Task 3. Join the first half of the sentence in Column A to the correct ending in Column B

Column A	Column B
1. The steering mechanism is needed	A cooling
2. An automobile is composed of	B consists of a manually operated steering wheel
3. The lights, radio and heater add to	C to guide the car in the right direction
4. The steering system	D many different working units and parts
5. The engine also needs	E the comfort and convenience of the car

Task 4. Complete the descriptions of drum brakes and a hand brake using the labels in the diagrams. One label is used twice.



Drum brakes consist of two (1) shoes, which are fixed to a (2) _____, which is fixed to an (3) _____.

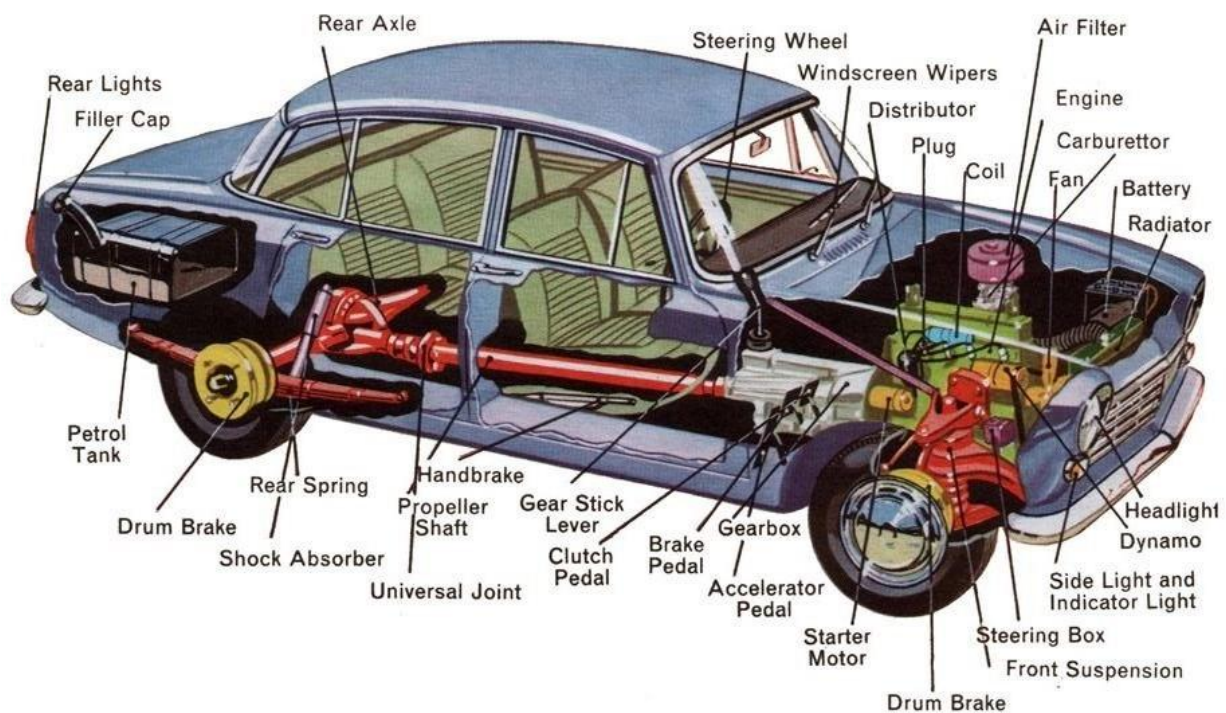
(4) _____ are riveted to the outer faces of each shoe. When the brake pedal is depressed, this increases the hydraulic pressure in the (5) _____ that runs from the master cylinder. This forces the two (6) _____ into contact with a rotating (7) _____, which is fixed to the wheel hub by the wheel nuts. The inner surface of the drum is ground smooth so that the shoe linings can rub against it.

A handbrake must be fitted to every car. This holds the vehicle stationary while it is left unattended. It can also function as an emergency brake if there is a failure of the main braking system. Normally, the hand brake operates on the (8) _____ and is linked to them via a (9) _____. The hand brake mechanism is operated by a (10) _____, which is held in the 'on' position by a ratchet and pawl mechanism.

Task 5. Compare these cars. Use “is (not) as...as”, “is...than”, “is much...than”, “is the...”, “is less...than”

Brand Ferrari	Brand Mercedes	Brand Mustang	Brand Lamborghini
Model 2010	Model 2015	Model 2010	Model 2015
Length 420 cm	Length 420 cm	Length 430 cm	Length 410 cm
Weight 1200 kg	Weight 1300 kg	Weight 1400 kg	Weight 1200 kg
Price 50 000\$	Price 45 000\$	Price 40 000\$	Price 240 000\$

Task 6. Memorize the terms describing interior components of a car.



2.2 Chassis Frame and Auto Body

Word list

chassis – ходова частина, корпус

frame – каркас

denote – позначати

propel – розігнати

integral – невід'ємний

transmission system – система передачі

rear axle – задня вісь

steering – рульове управління

suspension – підвіска

to withstand – витримувати

torque – обертовий момент

thrust – тяга

cornering – проходження поворотів

bending loads – згинальні навантаження

twisting – скручування

glass-panes – склопакети

pillar – стійка

cross member – поперечина

fatigue life – довговічність

uniformly distributed load – рівномірно розподілене навантаження

resistance – опір

Task 1. Read the text and name the components of chassis of a vehicle.

The Chassis

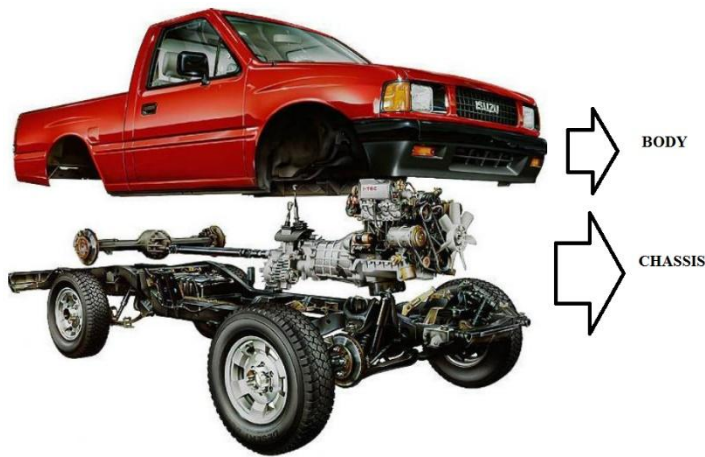
Chassis is a French term and was initially used to denote the frame or main structure of a vehicle. The chassis contains all the major units necessary to propel the vehicle, guide its motion, stop it, and allow it to run smoothly over uneven surfaces.

The chassis includes the following major components:

1. Major part of a chassis is a steel frame.
2. In case of a passenger car the whole body is also an integral part of the chassis. However, in commercial vehicles like trucks & buses the body is not a part of the chassis. Therefore, a chassis is almost a complete vehicle except body, other accessories which are not involved in the movement of the vehicle.
3. Other major components like Engine, Transmission system, Front & rear axle, Steering system, Suspension system, Wheels Tires & Brakes.

Functions of the chassis frame:

- To carry the weight of the vehicle and its passengers.
- To withstand the engine and transmission torque and thrust stresses, as well as accelerating and braking torque.
- To withstand the centrifugal force while cornering.
- To withstand the bending loads and twisting due to the rise and fall of the front and rear axles.



Auto body

Body is made of sheet metal or fiber glass, so that the passengers can sit in it. To make journey comfortable cushioned seats are provided. Body is provided on all sides with glass-panes fixed to protect the passengers from dust and rain. Bus bodies are mostly all metal bodies and can be either of (a) steel section pillars with steel sheet paneling, (b) steel section pillars with aluminum paneling, (c) all aluminum bodies, i.e., pillars, frame work and paneling are all made up of aluminum sections and sheets. This is because aluminum is very light in weight compare to steel. The body is fixed to the chassis with the help of I or U-bolts with rubber packing placed between the chassis and body cross members.

Requirements of Automobile Body

The body of a motor vehicle should fulfill the following requirements:

1. The body should be light.
2. It should have minimum number of components.
3. It should have long fatigue life.
4. It should have uniformly distributed load.
5. It should provide sufficient space for passengers and luggage.
6. It should have good access to the engine and suspension system.

7. It should create minimum vibrations when the vehicle is running.
8. It should have minimum resistance to air.
9. It should be cheap and easy in manufacturing.
10. It should provide clear all-round vision through glass areas.
11. It should be attractive in shape and colour.

Task 2. Answer the following questions.

- What are the functions of the chassis frame?
- What are requirements of Automobile Body?
- How does Automobile Body help in transport?

Task 3. Fill in the blanks.

1. A chassis is almost a complete vehicle _____ body.
2. Major part of a chassis is a _____ frame.
3. In commercial vehicles like trucks & buses the body is not a _____ of the chassis.
4. The body _____ to the chassis with the help of I or U-bolts.
5. It should have minimum _____ to air.

Task 4. Choose the correct letter a, b or c.

1. Chassis is a French term and was initially used to denote
 - a) fixing the automobile body
 - b) main structure of a vehicle
 - c) transmission system, front and rear axle
2. What is one of the functions of the chassis frame?
 - a) to provide clear all-round vision through glass areas
 - b) to provide sufficient space for passengers
 - c) to carry the weight of the vehicle and its passengers
3. Automobile body is made of

a) sheet metal or fiber glass

b) iron

c) copper

4. The body is fixed to the chassis with the help of

a) rivet

b) I or U bolts

c) welding

5. Automobile body should fulfill which of the following requirements

a) The body should be light

b) It should have a long fatigue life

c) Both (a) and (b)

Task 5. Compare the differences between these two sports cars. Modify comparisons, using the prompts.

	Roadster	GT Sport
1 Acceleration (0-100 kph / secs)	7.9	5.9
2 Fuel economy (kilometres per litre)	15.8	11.6
3 Stability	****	*****
4 Suspension	*****	****
5 Top speed (kph)	177	248
6 Power (brake horsepower)	157	246
7 Storage space (litres)	150	290
8 Price (€)	23,809	34,182

Example: The GT Sport accelerates a great deal faster than the Roadster.

1. Roadster / lot / economical / GT Sport

2. GT Sport / little / stable / Roadster

3. Roadster's suspension / slightly / good / GT Sport's

4. maximum speed / GT Sport / 71 kph / fast / Roadster's

5. Roadster's engine / two thirds / powerful / GT Sport's

6. GT Sport's storage space / twice / large / Roadster's

7. GT Sport / 50% / expensive / Roadster

Task 6. Write seven more sentences about the cars in Task 5, using the prompts.

Example: acceleration / worse

The Roadster's acceleration is much worse than the GT Sport's.

1. two thirds / fuel
2. unstable
3. less comfortable
4. two thirds
5. one and a half times
6. half
7. 30%

Unit 3

3.1 Agricultural vehicles

Word list

harvester – комбайн

traction – тяга

tillage – обробіток ґрунту

agricultural implements – сільськогосподарський інвентар

to provide – забезпечувати

thresher – молотарка

to harrow – боронувати

row crop tractor – трактор для просапних культур

loader – навантажувач

backhoe – екскаватор

pallet fork – вилка для піддонів

power tiller – мотокультиватор

waste straw – оброблена солома

oat – овес

rye – жито

barley – ячмінЬ

flax - льон

durability - довговічність

Task 1. Read the text and name the agricultural vehicles.

Tractor

Agricultural vehicles are used for farming. They include tractors, harvesters, etc. A tractor (Fig. 2.8) is a motor vehicle with large back wheels and thick tyres and is used in farms for pulling machinery at a slow speed. Tractors are mostly used for carrying the trailer or machinery used in agriculture or construction. It can be said that a tractor is a farm vehicle that provides the power and traction to mechanise agricultural tasks, especially (and originally) tillage. Agricultural implements are pulled behind or mounted on the tractor. The tractor also provides power to stationary equipment like thresher, blower, etc. Tractors are heavy vehicles used for pulling or pushing agricultural machinery or trailers at an extremely low speed.

Modern tractors usually employ large diesel engines which range in power output from 18 to 575 horsepower. ‘Tractor’ is the most commonly used term for the vehicle used on farms. The farm tractor is used for plowing, tilling, disking, harrowing, planting and similar tasks. A variety of specialty farm tractors have been developed for different purposes. These include row crop tractors with adjustable tread width to allow the tractor to pass down rows of corn, tomatoes or other crops. Many utility tractors are used for non-farm grading, landscape maintenance and excavation purposes, particularly with loaders, backhoes, pallet forks and similar devices. Small garden or lawn tractors designed for sub-urban and semi-rural gardening and landscape maintenance also exist in a variety of configurations. Tractors with small horsepower are known as. The durability and engine power of tractors make them very suitable for engineering tasks.



Fig. 2.8: Tractor

Combine Harvester

The combine harvester (Figs 2.9) is a machine that harvests grain crops. This machine combines three separate operations — reaping, threshing and winnowing — into a single process. Among the crops harvested with a combine are wheat, oats, rye, barley, corn (maize), soybeans and flax (linseed). The waste straw left behind on the field are dried stems and leaves of the crop with low nutrients. This leftover straw is either chopped and spread on the field or baled for feed and bedding for livestock. Combine harvesters are one of the most economically important laboursaving inventions, enabling a small fraction of the population to engage in agriculture.



Fig.2.9: Harvester

Task 2. Find the following information in the text:

1. What are the purposes of farm tractors?
2. What are combine harvesters used for?
3. What are the uses of a tractor?
4. How have agricultural vehicles helped the farmers?

Task 3. Complete the notes below with a suitable word or phrase from the texts. You can use up to 3 words.

1. Agricultural _____ may be towed behind or mounted on the tractor.
2. An agricultural vehicle is a farm vehicle that provides _____ and traction to _____ agricultural tasks.
3. Combines are used for _____ and _____.
4. Combines are one of the most economically important _____ inventions.

Task 4. Read the statements below and then decide if they are True (T) or False (F)

Statement	Answer
1. Agricultural vehicles are bulldozers, road rollers, dumpers, excavators.	
2. Tractors are used for various types of work like digging.	
3. Tractors carry the trailer or machinery used in agriculture or construction.	
4. Tractors can be used for non-farm grading.	

Task 5. Join the first half of the sentence in Column A to the correct ending in Column B

Column A	Column B
1. A tractor is a farm vehicle that provides	A. non-farm grading, landscape maintenance and excavation purposes, particularly with loaders, backhoes, pallet forks and similar devices.
2. Agricultural implements are pulled	B. sub-urban and semi-rural gardening and landscape maintenance also exist in a variety of configurations.
3. Many utility tractors are used for	C. the most economically important laboursaving inventions, enabling a small fraction of the population to engage in agriculture.
4. Lawn tractors designed for	D. the power and traction to mechanise agricultural tasks, especially tillage.
5. Combine harvesters are one of	E. behind or mounted on the tractor.

Task 6. Rewrite the sentences below. Instead of using somebody/people/they write a passive sentence:

1. Somebody composed the text using excerpts from the Enerdata press release of 30 May 2013 in Grenoble.
2. They elaborated the analysis of the trends in energy demand, based on 2011 data for G20 countries.
3. People observed strong alternations in using gas and coal in the USA and in Europe.
4. People characterized the world energy demand.in 2011 by bullish growing Chinese and Indian markets.

5. In the United Kingdom they increased the share of using coal for electricity production from 30% to 40%.
6. They built the Tolino Shine eReader within a partnership among three Germany's leading companies.
7. People control the eReader functioning through a sensory screen.

Task 7. Write the adjective in parenthesis with the correct ending ("-ed" or "ing").

1. Peter thought the marathon was ____ (challenge).
2. I was ____ (annoy) by his attitude.
3. Are you ____ (confuse)? Don't worry, I'll explain.
4. That movie was really ____ (depress).
5. It was an ____ (exhaust) day.
6. The children were ____ (frighten) by the storm.
7. You must be ____ (relieve) now that your exams are finished.
8. The news was ____ (discourage).
9. She is ____ (overwhelm) with work.
10. Could this situation be any more ____ (frustrate).
11. I was ____ (interest) in his lecture.

3.2 Transmission System

Word list:

internal combustion - внутрішнє згорання

increasing torque – збільшення крутного моменту

propeller shaft – карданний вал

to enable – давати можливість

driving shaft – приводний вал

to facilitate – сприяти

take up load – прийняти навантаження

without shock or jerk – без удару і ривка

heat dissipation – розсіювання тепла

dynamic balancing – динамічне балансування

vibration damping – гасіння вібрації

to damp – зволожувати

exertion – напруга

crankshaft – колінчатий вал

pressure springs – натискні пружини

releasing levers – відкидні важелі

release bearing – вижимний підшипник

release lever – важіль розблокування

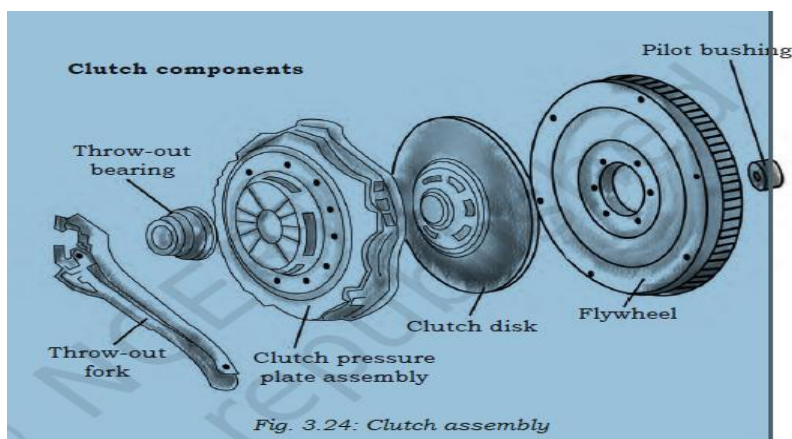
reverse gear – задній хід

Task 1. Read the text and name the components of the transmission system.

Transmission system is used in motor vehicles to supply the output of the internal combustion engine to the drive wheels. The transmission reduces the higher engine speed to the slower wheel speed, increasing torque in the process. Transmissions are also used in pedal bicycles, fixed machines and where rotational speed and torque need to be adapted.

The transmission system consists of the following components:

- Clutch assembly
- Gear box assembly (Transmission case assembly)
- Propeller shaft



Clutch assembly (Fig. 3.24) is a mechanism which enables the rotary motion of one shaft to be transmitted, when desired. The axes of driving shaft and driven shaft are coincident.

Functions of a Clutch:

- to disconnect the engine power from the gear box as required;
- to start the engine and warm it up;
- to engage first and second gear to start the vehicle from rest;
- to facilitate changing the gear as required; and
- to disconnect from the engine to stop the vehicle after application of brakes.
- to allow the engine to take up load gradually without shock or jerk.

Requirements of a Clutch

- Torque transmission or the ability to transmit maximum torque of the engine.
- Gradual engagement, i.e., to engage gradually and avoid sudden jerks.
- Heat dissipation, i.e., ability to dissipate large amount of heat generated during the clutch operation due to friction.
- Dynamic balancing, which means that the clutch should be dynamically balanced. This is particularly required in the case of high-speed engine clutches.
- Vibration damping, i.e., having a suitable mechanism to damp vibrations to eliminate noise produced during the power transmission.
- Size of the clutch should be as small as possible so that it occupies minimum space.
- Free pedal play, which helps the clutch to reduce effective load on the carbon thrust bearing and its wear.
- Easy in operation and requiring as little exertion as possible on the part of the driver.
- Light weight of the driven member of the clutch so that it does not continue to rotate for any length of time after the clutch has been disengaged.

Main Parts of a Clutch

- Driving members: The driving members consist of a flywheel mounted on the engine crankshaft. The flywheel is bolted to a cover which carries a pressure plate or driving disc, pressure springs and releasing levers. Thus, the entire assembly of the flywheel and the cover rotate all the time. The clutch housing and the cover provided with openings, dissipate the heat generated by friction during the clutch operation.
- Driven members: The driven members consist of a disc or plate, called the clutch plate. It is free to slide lengthwise on the splines of the clutch shaft (primary shaft). It carries friction material on both of its surfaces. When it

is gripped between the flywheel and the pressure plate, it rotates the clutch shaft through the splines.

- Operating members: The operating members consist of a foot pedal, linkage, release bearing, release levers and the springs.

Gear Box (Transmission Case) Assembly

We need different gear ratios in the gear box or transmission system to enable the vehicle to move at different speeds. At the time of starting the vehicle, the maximum amount of torque is available on the flywheel, for which low gear ratio is selected for the movement of the vehicle. As the engine speed increases, the amount of torque is reduced on the flywheel and it is required to select higher gear ratio.

Functions of a gear box:

- To provide a means to vary the leverage or torque ratio between the engine and the road wheels as required.
- The transmission also provides a neutral position so that the engine and the road wheels are disconnected even with the clutch in the engaged position.
- It provides a means to reverse the car by selecting the reverse gear.

Task 2. Find the following information in the text.

1. What is transmission system in motor vehicles used for?
2. What does the transmission reduce?
3. Where are transmissions used?

Task 3. Fill in the blanks.

1. Transmission system consists of _____ components.
2. The main parts of a clutch are _____ and _____ .
3. Different gear ratios in the _____ makes the vehicle move at different speeds.
4. The clutch assembly consist of flywheel, pressure plate and _____.

Task 4. Choose the correct letter a, b, c or d.

1. Which of these systems is used in motor vehicles to supply the output of the internal combustion engine to drive wheels?

- a) Transmission system
- b) Power system

- c) Torque system
 - d) None of the above
2. Which type of transmission system is used for a disengagement and engagement between the engine and the remainder of transmission system?
- a) Clutch
 - b) Differential
 - c) Propeller shaft
 - d) None of the above
3. In a four- wheel drive there is _____.
- a) one live axle
 - b) no live axle
 - c) two live axle
 - d) None of the above
4. _____ produces different gear ratios in automobiles.
- a) Transmission system
 - b) Differential
 - c) Steering
 - d) Gear box

Task 5. Join the first half of the sentence in Column A to the correct ending in Column B

1. The transmission reduces	A. as small as possible so that it occupies minimum space.
2. Size of the clutch should be	B. a foot pedal, linkage, release bearing, release levers and the springs.
3. The operating members consist of	C. the engine and the road wheels are disconnected even with the clutch in the engaged position.
4. The transmission provides a neutral position so that	D. the higher engine speed to the slower wheel speed, increasing torque in the process.

Unit 4

4.1 Active and Passive Safety

Word list

manufacturer – виробник

as follows – наступним чином

tempered – загартований

windshield – лобове скло

shattered glass - розбите скло

causing injury - заподіяння пошкодження

heat-treated glass – термічно оброблене скло

to impact – впливати

a harness – лямка, шлейка

occupant - водій, пасажир

collision – зіткнення

likelihood – ймовірність

severity - тяжкість

benefit – користь

inflation – надування

to absorb the energy – поглинання енергії

bumper face bar – лицьова панель

bumper reinforcement bar – арматура бампера

disabling devices – відключення пристроїв

satellite tracking system - супутникова система стеження

prior to purchasing – перед покупкою

duly – належним чином

audible warning – звукове попередження

vehicle tampering – втручання в транспортний засіб

fuel pump system – система паливного насоса

inoperable state – непрацездатний стан

Task 1. Read the text and tell what safety and security systems for automobiles you know.

There are different safety and security systems for automobiles available in the market and some of which are fitted by the manufacturer. Some of the active and passive security systems are mentioned as follows.

Safety Glass

Safety glass is used in all windows and doors of automobiles. The safety glass used in today's vehicles is of two types — laminated and tempered. These are considered as safety glass because of their varying strength. Laminated plate glass is used to make windshields. It consists of two thin sheets of glass with a thin layer of clear plastic between them. Some glass manufacturers increase the thickness of the plastic material for better strength. When this type of glass breaks, the plastic material tends to hold the shattered glass in place and thus, prevents it from causing injury.

Tempered glass is used for side and rear window glass but rarely for windshields. It is a single piece of heat-treated glass and has more resistance to impact than the regular glass of the same thickness. Thus, it has greater strength compared to a laminated plate glass.

Seat belts

A seat belt is also called a safety belt. It is a harness designed to protect the occupant of a vehicle from harmful movement, during a collision or when the vehicle stops suddenly. A seat belt (Fig. 3.39) reduces the likelihood and severity of injury in a traffic collision. It prevents the vehicle occupant from hitting hard against the interior elements of the vehicle or other passengers, and keeps the occupants positioned in place for maximum benefit from the airbag.

The passenger must fasten the seat belt for crash protection. However, in case of a passive safety system, such as the inflation of air bags at the time of an accident, is automatic. No action is required of the occupant to make it functional. Nowadays, seat belts are also provided for rear seat occupants.



Fig. 3.39: Seat belt

Airbags

An airbag (Fig. 3.40) is one of the passive safety systems for the occupants of a four-wheeler. The electrical system of airbags includes impact sensors and an electronic control module. In case of an accident, the sensor detects the impact and the airbag opens up to save the driver and other occupants. Energy-absorber Safety Bumpers Modern bumpers are designed to absorb the energy of a low-speed impact, minimising the shock directed to the frame and to the occupants of the vehicle. Most energy absorbers are mounted between the bumper face bar or bumper reinforcement bar and the frame.



Fig. 3.40: Air bags

Security Devices

There are three basic types of security devices available — locking devices, disabling devices and alarm systems. In automobile vehicle, an anti-theft system or device is installed to prevent theft of a vehicle. Many car security devices are available in the market. These are mechanical devices and ignition cut off devices, intelligent computerised anti-theft devices, satellite tracking system, engine control module, etc. Vehicle owners may select as per risk and install it in their vehicles. Prior to purchasing, the customers should check that these theft devices are duly approved from the Automobile Research Association of India (ARAI).

Important features of these devices are explained below.

- Alarm: In the case of vehicle tampering, audible warning sounds emerge

- Keyless Lock Device: To use the vehicle, electronic coding device is required
- Electronic Immobilisers: These built-in transponders send signals to the ignition and fuel pump system. The vehicle remains in stationary or inoperable state if the ignition starters do not get correct signals.
- Steering Wheel Lock: This device is fitted in the steering of the vehicle and it locks it in one place so that no one can drive it without removing the lock.
- Vehicle Tracking: Even if a thief steals a vehicle, the tracking technologies can help trace it. Tracking devices offer real-time location of the stolen vehicle with the help of the global positioning system (GPS).

Task 2. Find the following information in the text.

1. What are two types of safety glass?
2. What does a seat belt prevent from?
3. What does the electrical system of airbags include?
4. What are three basic types of security devices?
5. What are Electronic Immobilisers?

Task 3. Fill in the blanks.

1. Air bags are used for _____.
2. Seat belt is also known as a _____ belt.
3. Passive safety system helps _____.
4. Active safety system is used for avoiding _____.

Task 4. Choose the correct letter a, b, c or d.

1. Which types of anti- theft devices are available in a vehicle?
 - a) Locking devices
 - b) Disabling devices
 - c) Alarm systems
 - d) All of the above
2. Tempered glass is used for _____.
 - a) side and rear window glass

- b) auto window and door
- c) head light
- d) All of the above

3. Which of these safety systems are operated automatically?

- a) Passive safety system
- b) Active safety system
- c) Energy-absorber safety
- d) None of the above

4. Impact sensors are used in _____.

- a) electrical system
- b) mechanical system
- c) auto-mechanical system
- d) None of the above

Task 5. Read the statements below and then decide if they are True (T) or False (F)

1. The safety glass used in today's vehicles is only of one type.	
2. Tempered glass has more resistance to impact than the regular glass of the same thickness	
3. A seat belt reduces the likelihood and severity of injury in a traffic collision.	
4. An airbag is one of the active safety systems.	
5. Locking devices are one of the basic types of security devices.	

Task 6. Choose the correct verb form in each of the following.

1. In this process, the mixture is heated/is heating to 120C.
2. Once the salts are dissolving/have dissolved, the heat is reduced.
3. Several people have survived/are surviving the earthquake and are treating/are being treated in hospital at the moment.

4. For security purposes the employees change/are changing their passwords regularly.
5. Up until now people in this area have taken/take waste plastic to recycling centers, but at present we have tried/are trying a curbside collection system.

4.2. Car For Sale Adverts

Word list

mileage – пробіг

run out – закінчиться

MOT – техогляд

alloy wheels – литі диски

rear wiper - задній склоочисник

adjustable - регульований

steering wheel - рульове колесо

paintwork - лакофарбове покриття

year of manufacture – рік випуску

Task 1. Read the adverts and answer the following questions:

1. *What is the mileage on this car?*
2. *What safety features does it have?*
3. *What security features does it have?*

- Subaru Legacy
- 1998
- 125,000 miles
- Automatic
- 2.5L
- Petrol



5 Doors, Automatic, Petrol, 125,000 miles, Metallic Green, MOT-01-2023. Alloy wheels, Climate Control, Rear wiper, Heated door mirrors, Passenger airbag, Height adjustable driver's seat, Remote central locking, Driver's airbag, Steering wheel rake adjustment, Front electric windows, Electric door mirrors, Front fog lights. ROAD TAXED UNTIL JANUARY 2023. 900 \$

1. *What fault does this car have?*
2. *Can I view the car on Thursday at 4 pm?*

- Vauxhall Corsa
- 1998
- Hatchback
- 140,000 miles
- Manual
- 1.0L
- Petrol



3 Doors, Manual, Hatchback, Petrol, Blue, MOT-04-2023. Adjustable seats, Anti theft system, Central locking, Driver MORE CHEAP CARS AVAILABLE. OPEN MONDAY TO FRIDAY 9.00 AM TILL 2.30 PM 27 LONGWOOD ROAD, MANCHESTER, 700 \$

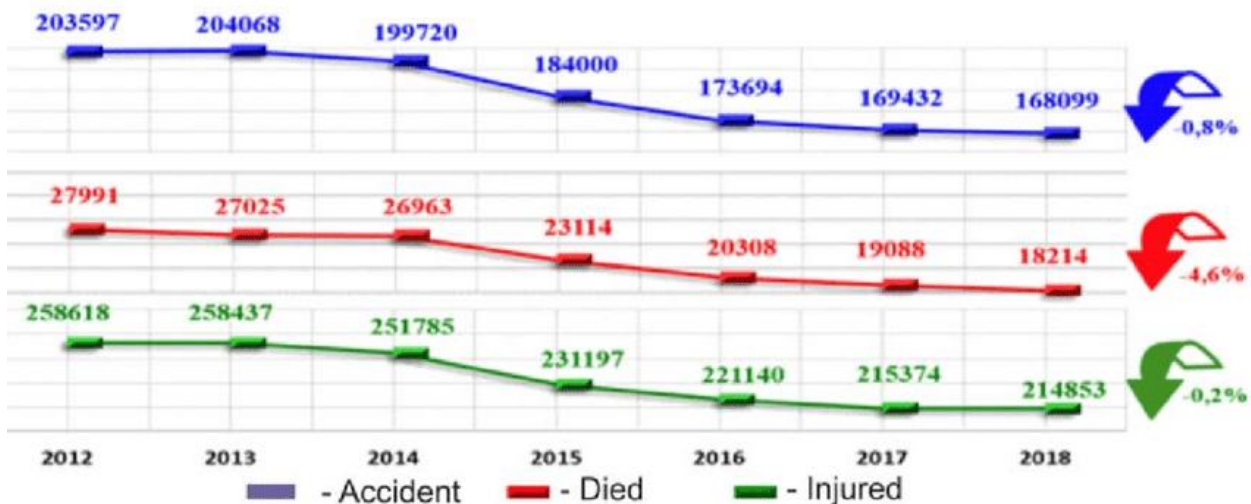
3. *When does the MOT run out?*

Task 2. Match the words with their definitions.

1. MOT	a) a number of miles travelled or covered
2. Road tax	b) a device which controls the temperature by way of a heating or air conditioning system

3. Fault	c) allows the driver to lock or unlock all of the car's doors at once, either with a remote or by locking or unlocking the driver's door
4. Remote central locking	d) a very bright light on the front of a vehicle that is used to help the driver see better in fog
5. Climate control	e) a tax paid every year by the owners of every motor vehicle which is being used on the roads
6. Fog light	f) a test which, by law, must be made each year on all road vehicles that are more than three years old
7. Mileage	g) a problem in a machine, system, design that makes it not work properly

Task 3. Look at the chart below. Complete the report with words from the box.



to be solved	as well as	until	remains	reduce
due to	through	at the end of	three quarters of	

However, despite some positive changes, the level of road traffic accidents in the country (1) _____ high. (2) _____ 2018, 168.1 thousand incidents were registered, in which 18.2 thousand were killed and 214.9 thousand people were injured.

The most common types of accidents are vehicle collisions (42.3%) and pedestrian collisions (29.1%). Most pedestrian accidents (67.5%) are (3) _____ violations by drivers. Almost (4) _____ these incidents occurred in the dark, in which 84.6% of pedestrians died.

In accordance with the tasks set by the Transport Strategy (5) _____ 2030, one of the most important tasks is to (6) _____ the number of deaths in a traffic accident per year per 10 thousand cars by more than 60%.

This problem is planned (7) _____ not only through the formation of a regulatory framework, improved traffic management and control activities, but also (8) _____ the use of intelligent transport systems in road transport and road infrastructure, (9) _____ improving the design of vehicles, including the development of unmanned vehicles.

Task 4. Your friend wants to buy a second-hand car but she needs some help. There are the cars she wants to test drive. Explain why your friend should/should not buy it.



Task 5. Now write your own Car For Sale Advert.

Навчальне видання

Методичні вказівки
з англійської мови «Пошук та обробка інформації»

для студентів
1 курсу спеціальності Автомобільний транспорт

English learner guide
«Information searching and processing»

for 1st year students
Specialty Automobile Transport

Укладачі:
КОРЖАВІНА Олена Євгеніївна
ІВАНОВА Юлія Юріївна

Роботу до друку рекомендувала доц. Тетяна ГОНЧАРЕНКО

В авторській редакції

План 2023 р., поз.

Підписано до друку 2023 р.

Формат . Папір офсетний. Гарнітура Times New Roman.

Друк ксерографічний. Ум. друк. арк. 1,5.

Наклад 100 прим

Видавничий центр НТУ «ХП».

Свідоцтво про державну реєстрацію ДК № 5478 від 21.08.2017 р.

61002, Харків, вул. Кирпичова, 2

Електронне видання
