**Выполните практические работы**

**Практическая работа № 1.**

**Gearbox**

**1. Read and translate the text:**

The gearbox is placed between the clutch and the propeller shaft. The principal function of the gearbox is to vary the speed of the car movement to meet the road conditions. The gearbox provides four for­ward speeds and one reverse, as follows: first or low gear, second gear, third gear, fourth or top gear, reverse gear.

There are many constructional arrangements of gearboxes, which can be classified as follows: sliding-mesh type, constant-mesh type, epicyclic (planetary) type.

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

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

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

**2. Answer the questions:**

1. Where is the gearbox situated?

2. What is the function of the gearbox?

3. What speeds does the gearbox provide?

4. What types of gearboxes do you know?

5. Why is the clutch shaft mounted in direct line with the gearbox shaft?

**3. Finish the sentences with the words and phrases**

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

**4.Read and translate sentences:**

1.Коробка передач предназначена для изменения скорости движения автомобиля.

2.Коробка передач обеспечивает четыре передние скорости и задний ход.

3.Коробки передач могут быть: со скользящими шестерня­ми, с постоянным зацеплением шестерен и планетарного типа.

4.Самыми простыми являются коробки передач со сколь­зящими шестернями.

5.Коробки передач с постоянным зацеплением шестерен используются наиболее часто.

**Практическая работа № 2.**

**The Starter**

1. **Read and translate the text in written form:**

The petrol engine must usually be set in motion before an explosion can take place and power can be developed; moreover, it cannot develop much power at low speeds. These difficulties have been overcome by the use of gears and clutches, which permit the engine to work at a speed higher than that of the wheels, and to work when the vehicle is at rest. An electric starter receiving its current from the storage battery, turns the crankshaft, thus starting the petrol engine. The starter motor is of a special type that operates under a heavy overload, producing high power for very short periods. In modern cars, the starter motor is automatically actuated when the ignition switch is turned on.

**2. Find equivalents in English in the text:**

Бензиновый двигатель, производить больше энергии, на скоростях (оборотах) выше, получающий ток, работать при высоких нагрузках, за короткие периоды.

**3. Use task 2 for making sentences.**

**4. Make 5 questions closely to the text.**

**Практическая работа № 3.**

**The Power Transmission**

**1. Read and translate the text:**

The engine power is delivered first to the flywheel and then to the clutch. From the clutch, which is the means of coupling the engine with the power-transmission units, the power flows through the transmission and is delivered into the rear-axle drive gears, or differential, by means of the drive shaft and universal joints. The differential delivers the power to each of the rear wheels through the rear-axle drive shafts.

**2.Use the Internet make a text about the power transmission.**

**3. Make 5 questions closely to the text.**

**Практическая работа № 4.**

**The Clutch**

**1. Complete the text with the suitable nouns from the list, read the text and translate it into Russian.**

***Nouns: gear, driving plate, solid contact, foot pedal, engine, transmission, type***

Some …. of clutch is found in every car. The clutch may be operated by means of a…., or it may be automatic or semi-automatic. The friction clutch and the fluid coupling are the two basic varieties. The friction clutch, which depends on… between engine and transmission, consists of: the rear face of the flywheel; the driving plate, mounted to rotate with the flywheel; and the driven plate, between the other two. When the clutch is engaged, the… presses the driven plate against the rear face of the flywheel. Engine power is then delivered through the contacting surfaces to the … .

Fluid coupling may be used either with or without the friction clutch. When it is the sole means of engaging the… to the transmission, power is delivered exclusively through an oil medium without any contact of solid parts. In this type, known as a fluid drive, an engine-driven, fan-bladed disc, known as the fluid flywheel, agitates the oil with sufficient force to rotate a second disc that is connected to the transmission. As the rotation of the second disc directly depends on the amount of engine power delivered, the prime result of fluid coupling is an automatic clutch action, which greatly simplifies the requirements for… shifting.

**2. Make a resume closely to the text.**

**Практическая работа № 5.**

**Manual and Automatic Transmissions**

**1. Read and translate the text:**

1.The transmission is a mechanism that changes speed and power ratios between the engine and the driving wheels. Three general types of transmission are in current use: conventional or sliding-gear, Hydra-Matic, and torque-converter systems.

2.The conventional transmission provides for three or four forward speeds and one reverse speed. It consists of two shafts, each with gears of varying diameters. One shaft drives the other at a preselected speed by meshing the appropriate set of gears. For reverse speed/an extra gear, known as the idler gear, is required to turn the driven shaft in the opposite direction from normal rotation. In high gear, the two shafts usually turn at the same speed. In low, second, and reverse gears, the driven shaft turns more slowly than the driving shaft. When a pair of gears permits the driven shaft to turn more rapidly than the driving shaft, the transmission is said to have overdrive. Overdrive is designed to increase the speed of a car.

3.The Hydra-Matic type of transmission combines the automatic clutch provided by fluid coupling with a semiautomatic transmission. A mechanical governor, controlled by the pressure exerted on the accelerator pedal, regulates gear selection through a system of hydraulically controlled shift valves. Hydra-Matic transmission provides for several forward gears.

4.The torque-converter type of transmission provides an unlimited number of gear ratios with no shifting of gears. The torque converter is a hydraulic mechanism using engine power to drive a pump, which impels streams of oil against the blades of a turbine. The turbine is connected to the drive shaft and causes it to rotate.

5. Both Hydra-Matic and torque-converter systems are controlled by a selector lever on the steering column, which provides also for reverse and sometimes for emergency-low gears.

**2. Answer the questions:**

1. What is the transmission?

2. What general types of transmission are used nowadays?

3. What does the conventional transmission provide?

4. What converter is hydraulic?

5. What systems are controlled by a selector lever on the steering column?

**3. Make a title to each paragraph. Retell the text.**

**Практическая работа № 6.**

**The Running Gear**

**1. Read and translate the text:**

The running gear of the car includes the wheel-suspension system, the stabilizers, and the wheels and tyres. The frame of the car may be considered the integrating member of the running gear. It is attached to the rear axle and to the front wheels by springs. These springs, along with the axles, the control and support arms, and the shock absorbers, constitute the wheel-suspension system. In modern cars the front wheels are independently suspended from the frame in a manner that permits either wheel to change its plane without appreciably affecting the other. This type of front-wheel suspension is known popularly as independent suspension. The stabilizers consist of spring-steel bars, connected between the shock-absorber arms by levers, to decrease body roll and improve steerability.

**2. Find words in the puzzle**: *running, gear, wheel, tyre, axle, spring, frame, lever, body***. Read across, down and diagonally. Make sentences with them close the text.**

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| **B** | **O** | **D** | **Y** | **D** | **T** | **G** | **L** | **D** |
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| **A** | **X** | **L** | **E** | **I** | **O** | **A** | **S** | **K** |
| **E** | **D** | **C** | **N** | **C** | **O** | **R** | **A** | **S** |
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| **N** | **U** | **M** | **X** | **X** | **T** | **Y** | **R** | **E** |
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**Практическая работа № 7.**

**The Control System**

**1. Read and translate the text written. Make the thesis of the text:**

Steering is controlled by a hand wheel, mounted on an inclined column and attached to a steering tube inside the column. The other end of the tube is connected to the steering gear, which is designed to provide maximum ease of operation. Power steering, adapted for passenger cars in the early 1950s, is generally a hydraulic mechanism used as a booster to reduce the effort of steering.

A car has two sets of brakes: the hand or emergency brake and the foot brake. The emergency brake generally operates on the rear wheels only. The foot brake in modern cars is always of the four-wheel type, operating on all wheels. Hydraulic brakes on cars and hydraulic vacuum, air, or power brakes on lorries apply the braking force to the wheels with much less force on the brake pedal than is required with ordinary mechanical brakes. The wheel brakes are generally of the internally expanding type, in which a convex strip of material is forced against a concave steel brake drum.

**Практическая работа № 8.**

**Brakes**

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**1. Read and translate the text. Pay attention to new words:**

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| brakes — барабанные тормоза  band brake — ленточный тормоз  disk brakes - дисковые тормоза  shoe brake — колодочный тормоз  hydraulic assisted brakes — тормоза с гидравлическим приводом | Brake shoes — колодки тормоза  Brake fluid — тормозная жидкость  Brake pedal – тормозная педаль  Master cylinder – главный цилиндр |

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

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

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

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

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

**2. Find the following in the text:**

Тормоза, безопасность пассажиров зависит от правильной работы тормозов, барабанные тормоза, дисковые тормоза, тормоза с усилителем, гидравлический привод тормозов, жидкость под давлением, тормоза срабатывают, тормозное усилие, нажать на тормозную педаль.

**3. Answer the questions:**

1. What is the function of the brakes?

2. What types are brakes divided into?

3. What brakes do you know according to their mode of opera­tion?

4. What braking systems are used today?

5. By what are brakes controlled?

6. When are brakes applied?

**4. Translate into English:**

1.Тормоза являются наиболее важным механизмом авто­мобиля.

2.Они используются для замедления движения или оста­новки автомобиля.

3.Тормоза можно разделить на два типа, а именно: барабан­ные тормоза и дисковые тормоза.

4.На большинстве автомобилей используется гидравли­ческий привод или пневматический привод.

5.Тормоза срабатывают, когда водитель нажимает на тормозную педаль.