

UNIT 10. LATHE

Active Vocabulary:

- lathe – токарный станок
- bed – станина станка
- headstock – передняя бабка
- tailstock – задняя бабка
- apron – фартук, основная поворотная доска резцовой каретки
- carriage – каретка станка
- to traverse – пересекать; поперечина
- to clamp – крепить, закреплять
- spindle – шпиндель
- to maintain – поддерживать, обслуживать, содержать
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Word combinations for connected reading:

- linear feed motion – прямолинейное движение подачи
- feed gearbox – коробка передач
- speed gearbox – коробка скоростей

Ex. 1. Read and translate the text:

- The **lathe** is the most general and useful of all machine-tools and is used in producing many types of machine parts.
- In machining operations on **lathes**, the work is rotated, while the cutting tool has a **linear feed motion**.
- Although there are many types of **lathes** employed in industry, they have many units and parts in common. The principle units of an engine **lathe** are the **bed**, **headstock**, **tailstock**, **feed gearbox**, **apron** and **carriage**. All the principle units of the **lathe** are mounted on the **bed**. The **lathe** has ways along which the **carriage** and **tailstock** **traverse**. The work is **clamped** and rotated by the **head-stock** which contains the **spindle** and **speed gearbox**. In all **lathe** work it is the most important to **clamp** the work and the tool as firmly as possible.
- The separate parts and mechanisms of the **lathe** can be **maintained** in proper operating condition only by attentive care.

Ex. 2. Find the Russian equivalents for the following word combinations:

the most useful of all machine-tools	деталь вращается
the work is rotated	содержит шпиндель
in producing parts	содержать в особых условиях
are mounted on the bed	крепятся на станине
is rotated by the headstock	вращается при помощи передней
to maintain in proper condition	бабки
contains spindle	в изготовлении деталей
	наиболее используемый из станков

Ex. 3. Answer the questions to the text:

- What machine-tools are the most general?
- Where is lathe used?
- What are the main parts of an engine lathe?
- Where are all the principle units of the lathe mounted?
- What does the headstock contain?
- When is the headstock rotated?

Ex. 4. Agree or disagree with the statements using the following phrases:

- *I agree. I disagree.*
- *You are right. You are wrong.*
- *It's right. It's false.*
- *As far as I know ...*
- *According to the information from*
- *the text ...*
- Lathe is used in manufacturing many types of machine-tools.
- The principle units of an engine lathe are the bed, headstock, speed gearbox, feed gearbox, apron and carriage.
- The work is rotated by the tailstock.
- The lathe parts are clamped on the bed.
- The headstock contains the carriage and feed gearbox.

Ex. 5. Put the verb in brackets into the Past Simple or Past Continuous:

1. The cat (to take) a piece of fish and then (to run) away.
2. He (to read) a newspaper when I (to come) in.
3. Yesterday I (to get) up at eight o'clock.
5. The train (to start) at fifteen minutes to ten.
5. He (to put) on his coat and cap, (to open) the door and (to go) out.
6. At this time yesterday I (to watch) a play by Chekhov at the theatre.
7. He (to come) back to St Petersburg on the 15th of January.
8. I (to go) to the institute when I (to see) him.
9. At this time yesterday we (to have) dinner.
10. He (to write) a letter when I (to come) in.

- 11. He (to make) a report when I (to leave) the meeting. 12. Yesterday he (to write) a letter to his friend. 13. When I (to look) at them, they (to smile) at me. 14. What you (to do) at six o'clock yesterday? 15. I (to go) to bed at half past eleven. 16. Yes-terday the lesson (to begin) at nine o'clock. 17. When somebody (to knock) on the door, she (to argue) with her husband. 18. When Pete (to jog) in the park in the morning, he (to lose) his expensive mobile phone. 19. When the police (to take) the thief to the car, I (to go) to the cinema to see the new Tom Cruise film. 20. He (to shave) when he (to hear) her scream.

Ex. 6. Complete the sentences choosing the appropriate variant from the box:

- headstock linear feed motion rotated
- The cutting tool has ...
- In machining operations on lathes the work is ...
- The work is clamped and rotated by ...
- The spindle and speed gearbox are the parts of ...

Ex. 7. Translate into English:

- Токарный станок используют в производстве деталей.
- Прямолинейное движение подачи режущего инструмента обеспечивает вращение детали.
- На станине крепятся основные части токарного станка.
- Деталь вращается при помощи передней бабки.
- Передняя бабка содержит шпиндель и коробку скоростей.
- Станина и задняя бабка – это основные части токарного станка.

Ex. 8. Back to history. Read the text and try to understand it without translating:

The lathe is an ancient tool, dating at least to ancient Egypt and known to be used in Assyria and ancient Greece. The lathe was very important to the Industrial Revolution.

The origin of turning dates to around 1300 BCE when the Ancient Egyptians first developed a two-person lathe. One person would turn the wood work piece with a rope while the other used a sharp tool to cut shapes in the wood. Ancient Rome improved the Egyptian design with the addition of a turning bow. In the Middle Ages a pedal replaced hand-operated turning, freeing both the craftsman's hands to hold the woodturning tools. The pedal was usually connected to a pole, often a straight-grained sapling. The system today is called the "spring pole" lathe. Spring pole lathes were in common use into the early 20th century.

An important early lathe in the UK was the horizontal boring machine that was installed in 1772 in the Royal Arsenal in Woolwich. It was horse-powered and allowed for the production of much more accurate and stronger cannon used with success in the American Revolutionary War in the late 18th century. One of the key characteristics of this machine was that the workpiece was turning as opposed to the tool, making it technically a lathe (see attached drawing). Henry Maudslay who later developed many improvements to the lathe worked at the Royal Arsenal from 1783 being exposed to this machine in the Verbruggen workshop.

During the Industrial Revolution, mechanized power generated by water wheels or steam engines was transmitted to the lathe via line shafting, allowing faster and easier work. Metalworking lathes evolved into heavier machines with thicker, more rigid parts. Between the late 19th and mid-20th centuries, individual electric motors at each lathe replaced line shafting as the power source. Beginning in the 1950s, servomechanisms were applied to the control of lathes and other machine tools via numerical control, which often was coupled with computers to yield computerized numerical control (CNC). Today manually controlled and CNC lathes coexist in the manufacturing industries.

Ex. 9. Make up a summary of the text from ex. 8 with the help of the following phrases:

- This text tells ...
- The origin of turning dates to ...
- Later Ancient Rome improved ...
- Speaking further, in the Middle Ages ...
- Besides, an important early lathe in the UK was ...
- Furthermore, one should not forget that Henry Maudslay ...
- During the Industrial Revolution ...
- All in all in the early 1950-s ...